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AMIGA SHOPPER

The top-selling serious Amiga magazine

ISSUE 14 • JUNE 1992 • £1.25 • YOUR DEFINITIVE GUIDE

MEGA RAM ROUND-UP

Looking for more memory? We compare 15 best buys

BEGINNERS START HERE
We'll help you master your Amiga

AMIGA ANSWERS
Got a problem? – We'll solve it! Pages 45-74

PLUS

SCAN IT!

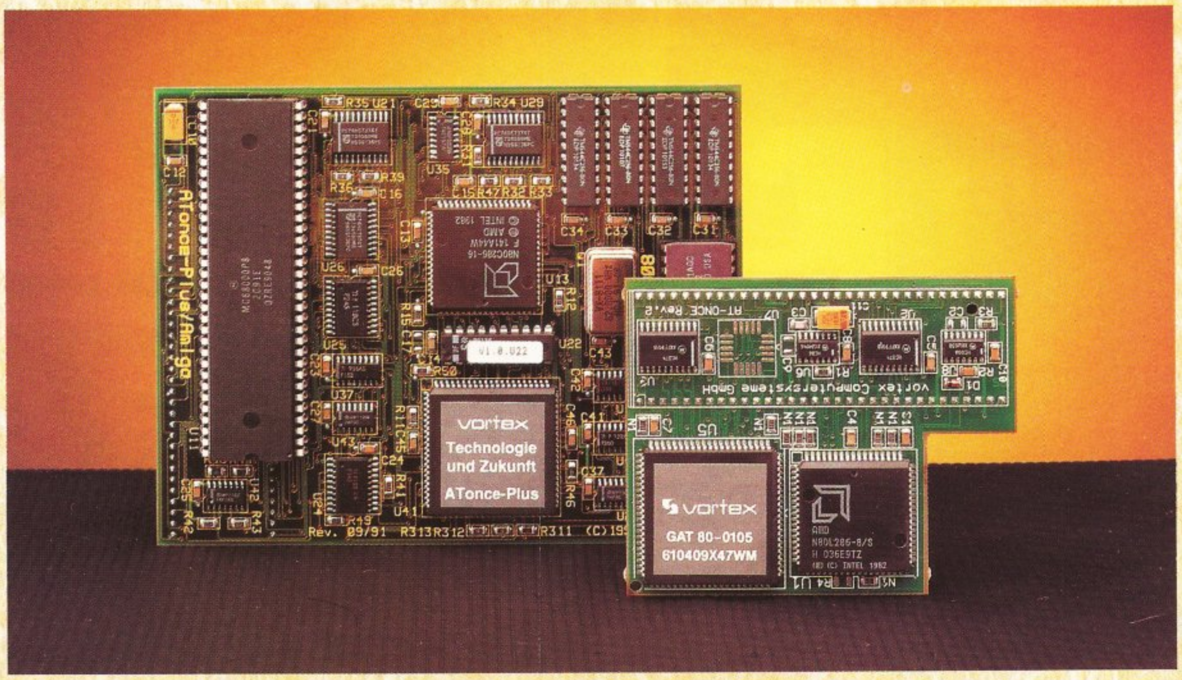


Amiga Shopper reviews and rates the best of the hand scanners

SHOW TIME!
BEST AMIGA SHOW EVER – ALL THE DETAILS INSIDE

Future Publishing
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VORTEX ATONCE



The Solution in 286 AT Emulation for Amiga 500, Amiga 500-Plus, Amiga 2000

vortex ATonce-classic and vortex ATonce-Plus are the solutions in 286 AT emulation for the Amiga 500, Amiga 500-Plus and Amiga 2000. These emulators convert your Amiga into a PC/AT compatible computer with multi-processor and multi-operating system facilities.

Work with PC/AT programs and games under DOS as well as with your Amiga under AmigaDOS. ATonce runs as a task within AmigaDOS and is totally transparent when not in use.

All components guarantee 286 AT emulation with a high degree of compatibilty and provide your Amiga with full system reliability.

ATonce is compatible with Kickstart 2.0. Windows 3 runs unrestrictedly in the Protected Mode. It accesses the entire environment of your Amiga: Commodore compatible hard disks, internal/ external disk drives and RAM, the serial/ parallel interface, mouse, sound, RTC and CMOS RAM. Video emulations such as EGA and VGA in a monochrome graphics mode, CGA with 16 colors, Hercules, Olivetti and ToshibaT3100 are available. ATonce fits directly into the socket of the 68000 CPU[1], so that a RAM expansion, if present, need not be removed. The expansion port at the side and the trap-door expansion port at the bottom remain free.

ATonce-classic is the emulator for the Amiga 500/ A 500-Plus. Its 286 CPU, rated with 7.2 MHz, offers a Norton SI ≤ 6.3.

Start with ATonce-classic for: **£ 139** RRP INC VAT

ATonce-Plus is the professional 286 AT emulator with 512 KB RAM and a socket for an optional 80C287-12 arithmetic co-processor. The 286 CPU, with a 16 MHz clock frequency, offers a Norton SI ≤ 16.2. Full 640 KB DOS memory are available. ATonce-Plus can be fitted inside the Amiga 500, A 500-Plus and A 2000.

The price for this solution: **£ 249** RRP INC VAT

For more information, contact your local Amiga dealer or call Compuserve at 100015,330.

[1] The guaranty might be voided. All company or product names are trademarks or registered trademarks of their respective holders. ATonce is the registered German trademark of vortex Computersysteme GmbH. Distributed in the UK by: SDL, 10 Ruxley Corner Industrial Estate, Edgington Way, Sidcup, Kent, DA14 5SS, Tel. 081-309 5000, Fax. 081-300 5440

AMIGA SHOPPER AT A GLANCE GUIDE

To help you find what you want quickly and easily, this is a cross-referenced list of all the products and subjects covered in this month's *Amiga Shopper*. The subjects covered in Amiga Answers are detailed on page 45; the many PD programs covered on page 148 are listed there. The page numbers given are for the first page of the article in which the product is mentioned.

Are there any products or subjects you'd like us to take a look at? Well, just drop a line to: Amiga Shopper, 30, Monmouth Street, Bath BA1 2BW.

WELCOME

When we ran our readers survey a couple of months back, the one item which most of you stated you intended buying turned out to be a RAM upgrade. Seems to me that memory is like money – everyone wants more of it. And even if you've got the full 8 Meg upgrade on board your Amiga, you'll probably still find it insufficient one day. So buy as much as you can afford now. But not until you've read our definitive five pager on RAM boards which starts on page 21!

The other main feature this month is a round-up of the best hand-held scanners. These really are the most cost effective way of importing pictures into your various applications, but next month, for those of you with serious needs (and serious dosh) we'll be reviewing a new Epson colour flatbed scanner – the GT6000 – which will handle 24-bit images at up to 600 dots per inch. Oh and incidentally, guess what its memory overhead is at maximum resolution? – a single A4-sized image takes up an unbelievable 148 Megs!

So, as you might expect, we're playing around with lower resolutions. But it just goes to show that memory is the key to getting the most from your Amiga.



Otherwise, the main piece to look out for this month is the first part of our new series on Artificial Intelligence. While it won't build into a practical guide to turning your Amiga into a fully-functioning cyborg, it will at least show you how to get to grips with the exciting area of neural networks. So get to it, and if you manage to build an AI, tell us first – we'll run it in our news pages!

Andy Stoner

Editor

PUBLIC DOMAIN WORLD

COMPRESSION SPECIAL

There are thousands of Amiga programs which are available for little more than the price of a disk. And many more which allow you to try the software free before you buy. Each month in Public Domain World we examine the best of these programs and explain how to get hold of them.

This month our resident PD sampler, Ian Wrigley, scans through his latest batch to pick out the top PD and shareware compression utilities that'll save you disk space and make archiving a doddle – so...

SQUEEZE IT!

THE PRESSURE BEGINS ON PAGE 148

AMIGA ANSWERS

15 PAGES DEVOTED EXCLUSIVELY TO ANSWERING YOUR QUESTIONS

Every month in Amiga Answers our panel of experts answer more genuine reader questions than any other Amiga magazine. And for beginners our easy Expert Tips will help you get to grips with your Amiga, and understand the other features in this month's issue.

We answer questions every month on Workbench • The CLI • Comms • Programming • DTP • Video • Business software and more.

THE ANSWERS START ON PAGE 45

FOR A FULL LIST OF CONTENTS, TURN THE PAGE

Your guarantee of value

This magazine comes from Future Publishing, a company founded just seven years ago, but which now sells more computer magazines than any other publisher in Britain. We offer:

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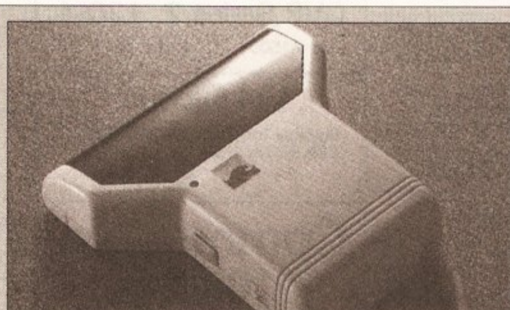
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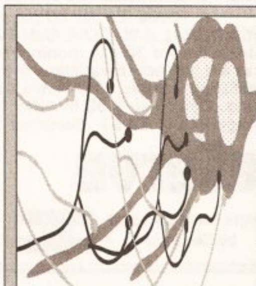
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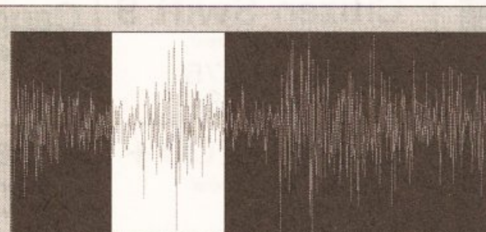
INSIDE THIS ISSUE

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G-FORCE REDESIGNED

The G-Force series of accelerators from American-based GVP has been revamped to provide improved performance at reduced prices.

The bottom-of-the-range board has had the speed of its 68030 processor upped from 22 to 25MHz. It comes with a SCSI controller, a 68882 Floating Point Unit and 1Mb of 32-bit RAM, expandable to 13Mb. It costs £599.

The Combo 33 has been replaced by a 40MHz version. This also features a SCSI controller and Floating Point Unit. It comes with 4Mb of 32-bit RAM, expandable to 16Mb. There is an option for a factory installed Quantum hard drive on the board, of 120 or 240Mb capacity.

These two accelerators make use of the 680EC30 processor, an economical version that does not require a Memory Management Unit. It is still possible to remap the Kickstart ROM into 32-bit RAM as other accelerators do (thus increasing operating speed) via the use of hardware trickery. The board costs £999.

The leader of the G-Force range comes with a standard 68030 processor clocked at 50MHz. Also included is a Floating Point Unit, a SCSI controller and 4Mb of 32-bit RAM, expandable to 16Mb. An option is available to have a 240Mb Quantum hard disk installed on the board. It sells for £1399.

GVP is on ☎ 0101 215 337 8770. Products are distributed in this country by Silica Shop ☎ 081 309 1111. Both companies will be present at the *Amiga Shopper Show*, on stands A26 and B2.

New accelerators for the Amiga blessed with a touch of the divine

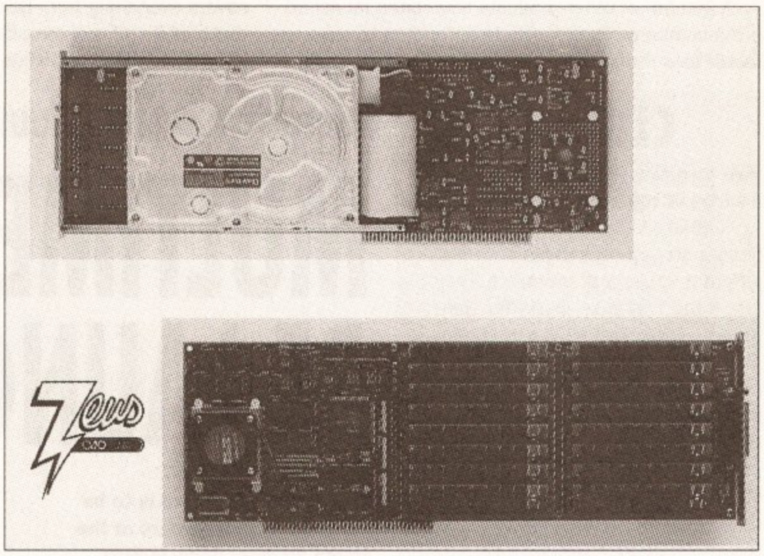
GOD'S SPEED FOR AMIGA OWNERS

American-based Progressive Peripherals & Software has announced a number of new accelerators for the Amiga.

Most impressive of the new products is Zeus, a 68040 accelerator, SCSI-2 controller and RAM expansion for the A1500/2000. Zeus comes with a 68040 processor, clocked at 28MHz. A 33MHz version will be available when Motorola releases the chip, probably in June or July.

The SCSI-2 controller is compatible with ordinary SCSI drives, but when used in conjunction with a SCSI-2 drive it delivers a transfer rate of up to 10Mb/s – eight times faster than a standard SCSI system. Zeus is expandable to 64Mb of 32-bit RAM, using 1Mbx8 or 4Mbx8 SIMM modules. These can be page, static column or nibble mode SIMMs. The basic system, with 28MHz processor and no RAM, is £1,449.

The Progressive 040/500 is a 28MHz 68040 accelerator for the Amiga 500 and A500 Plus, providing a 25-fold increase in speed. The board fits internally in the Amiga. It comes with 4Mb of 32-bit RAM and has on-board Kickstart 2 ROMs. It is software switchable between versions 1.3 and 2. The supplied FASTROM utility enables the user to copy the operating system in 32-bit RAM to further improve performance.



By Zeus! An accelerator for the Amiga that processes over 30 million instructions per second. Overtake those slow-coach SPARC and RISC-based workstations as you head for the Olympian pinnacle of computing performance

Another model, the Progressive 040/500i offers all the facilities of the above, but is missing the built-in floating point processor. Prices for both boards are to be announced.

Also new is Mercury, a 68040-based accelerator for the Amiga 3000. The card runs at 28MHz and includes a built-in floating point processor and Memory Management Unit. Up to 32Mb of 32-bit RAM can be installed on-board. This can be augmented by Progessive's ProRAM board for the A3000 which, with its 64Mb, takes the A3000's memory up to a staggering 114Mb. Prices for Mercury start at £1,249.

Progressive Peripherals & Software is on ☎ 0101 303 825 4144 and exhibiting on stand A32 at the Amiga Shopper Show, where it will also be demonstrating Rambrandt, its 32-bit colour video graphics system. Its products are available in the UK from Power Computing ☎ 0234 843388 on stand C6 at the *Amiga Shopper Show*.

PANASONIC PRINTERS LAUNCHED

Two new dot-matrix printers have been launched by Panasonic. Both the KX-P2123, a 24-pin model, and the 9-pin KX-P2180 QuietPrinters provide full colour output at sound levels which are claimed to be lower than many laser and ink-jet printers.

Each of the printers has a palette of seven colours – magenta, blue, violet, yellow, red and green – and each comes with six letter quality fonts: Courier, Bold PS, Prestige, Sans Serif, Roman and Script. The KX-P2123 also comes with a Super Quality Roman font.

Paper can be fed into the printers from the bottom, top and rear, either as single sheets or continuous forms. Maximum print speed is a claimed 240 characters per second in draft mode.



Be very, very quiet if you're hunting for printers – Panasonic's two colour QuietPrinters join the hardcopy jungle

The KX-P2123 costs £340; the KX-P2180 costs £270. Panasonic is on ☎ 0344 853915.

WORKBENCH UPGRADE TESTING

Version 2.1 of Workbench is currently undergoing testing in the developer community before general release.

The latest incarnation of the operating system comes on disk and requires the Kickstart 2 ROM to run. It boasts a number of improvements, primarily: the inclusion of a choice of European languages for menus and requesters; the abolition of Mountlist and its replacement by a Storage drawer; and the inclusion of CrossDOS, giving the Amiga owner the ability to read and write to PC format floppy disks as standard.

When asked to comment, Commodore's Andrew Ball stated that there are many products currently being tested, not all of which will see the light of day. He remarked that Workbench 2.1 was evidence of the continual evolution of the Amiga's operating system.

MORE MUSIC FROM BLUE RIBBON

Blue Ribbon SoundWorks, the company behind music software such as *Bars&Pipes* and *SuperJAM!*, has released a universal synchronisation box.

Called SyncPro, the unit enables users to synchronise MIDI music with multimedia, video and audio hardware. It works with any Amiga application that uses MIDI Time Code, including the company's own sequencer products.

The box supports all major synchronisation formats, including SMPTE, MIDI Time Code and Song Pointer. A UK price has not been finalised.

A number of other products have been launched by the company. These include an update to *Bars&Pipes Professional*. Version 1.0e fixes some of the bugs present in earlier versions and enables owners to get the most out of the *Pro Studio Kit* and the *Creativity Kit*. The upgrade is free to existing owners. *Bars&Pipes Professional* costs £299.

Three Extras disks have been released for use with *SuperJAM!*. These sell for £24.95 each, and provide collections of musical styles, demos and chord progressions. The three disks are entitled Pop/Rock, Classical and Cutting Edge. The Pop/Rock disk includes such styles as Gospel Waltz, Go Go and FunkMellow; the Classical disk covers everything from Bach to Rachmaninov, with a touch of Stravinsky (an office favourite here) thrown in for good measure; while the Cutting Edge disk includes such dangerous sounds as Punkarama and Funkjungle.

The company has also announced the start of the Tools Without A Home scheme. The idea is to distribute on disks tools and accessories developed by users of *Bars&Pipes* and *Bars&Pipes Professional*. The first disk includes utilities to create arpeggios and to re-direct MIDI event descriptions to a file or device. Full source code is included with all of the utilities supplied. A UK price has not yet been finalised.

The Blue Ribbon SoundWorks is on ☎ 0101 404 377 1514. Its products are sold in the UK by Zone Distribution ☎ 071 738 5444. Zone will be exhibiting on stand A34 at the *Amiga Shopper Show*.

CLIP ART

New company Diskotech is to release a series of clip art disks for the Amiga.

Called *Movieclip*, the library intially boasts six separate disks covering different aspects of transport. They are: Road Traffic 1, Air Traffic, Rail Riders, Horse Traffic, Water Traffic and Road Traffic 2. The graphics – consisting of animations, cut and paste images and backgrounds – on each disk share the same 32 colour palette, and so may be combined with ease. The disks cost £10 each. A demo disk is available for £1. Diskotech is on ☎ 05912 242.

CAD PACKAGE CHANGES HANDS

The development and distribution of the *XCad* range of draughting programs has been taken over by Digital Multimedia Services.

The company is launching *XCad 2000* and *XCad 3000*, both of which should be available by the time you read this. They will sell for £151.50 and £352.50 respectively. A full refund is available to users upgrading from *XCad 2000* to *XCad 3000*. Digital Multimedia is on ☎ 0702 206165.

Interactive systems launch into action at the Amiga Shopper Show…

MULTIMEDIA SYSTEM TO BE LAUNCHED AT SHOW

An information system is to be launched by Pictureware at the *Amiga Shopper Show* in May.

Called the Information Centre, the system is based around an American A2500 (an Amiga with a 68020 processor clocked at 16MHz) and provides multimedia facilities for such applications as point of information, point of sale, and point of advertising. Its debut rôle will be at the *Amiga Shopper Show*, where it will be used as a 300 page electronic show guide to dispense information about the exhibitors.

Other applications are planned, including a museum and a zoo guide. As Nik Williams, MD of Pictureware, points out, computers are only the foundation of a multimedia system. His company supplies not only the hardware but the software and programming skills as well. "We don't see any two applications being the same," he says, "so it is imperative to remain flexible on how we structure our service to each and every one of our clients."

For more details on the Information Centre, call Pictureware on ☎ 0792 470503.

Alternatively, try it out yourself at the *Amiga Shopper Show*. With about 300 pages of information at your fingertips, you can key in to the latest infomation on exhibitors and, if you're feet are failing you at the end of a long day, you can even find the shortest route to your chosen stand with its map of the exhibition.The Information Centre is on stand A12.



Pictureware's new Information Centre, to be launched at the *Amiga Shopper Show*, Wembley, in May

Pronto printer from Seikosha

A high speed 24-pin dot matrix printer is to be launched by Seikosha.

With claimed speeds of up to 320 characters per second in draft mode and 108 cps in letter quality mode, the SL210 is no slouch. Compatibility is assured with Epson LQ850 and IBM Proprinter 24 emulation modes.

Nine fonts are provided, each of which can be printed as normal, bold or italic. Printing can be to continuous and single sheet stationery. An unsual feature is the printer's view button, which enables the user to scroll the paper up so that what has already been printed can be clearly seen. Releasing the button returns paper to its previous position, ready for further printing.

Seikosha sees the printer as a real challenge to the laser printer market. Said Gareth Cornish, Seikosha's sales manager: "Print speeds and 24-pin quality are comparable to those of low end lasers but the dot matrix has many advantages in paper handling flexibility, lower capital outlay and running costs."

The Sl210 will retail for £611. Seikosha ☎ 0753 685873.

POWER UP SCHEME TO BE INTRODUCED

Commodore UK is set to introduce the popular Power Up scheme from the United States.

The scheme will enable existing owners of Commodore computers to receive a discount when upgrading.

Details have yet to be finalised, but it seems likely that the deal will only apply to users wishing to upgrade to the Amiga 3000.

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Home Accounts2®
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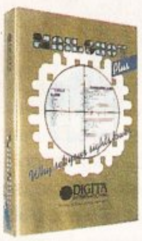




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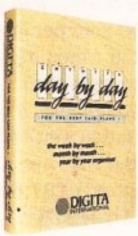
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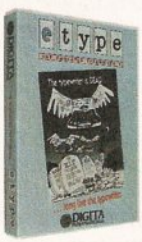
DGBase
If you're looking for fast access to information, and the ability to create customised reports, then this relational database is for you (ST). **£49.99**



Day-By-Day
An excellent way to get organised. You'll be reminded of birthdays, meetings and appointments. It includes month/week/day planners and automatic reminders of overdue events. **£29.99**

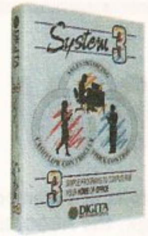
Personal Tax Planner
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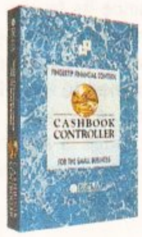


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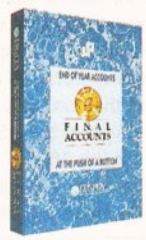
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System 3e
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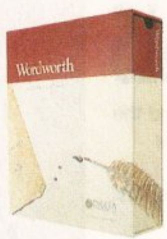


Cashbook Controller
Take the drudgery out of book keeping as this program will replace your cash and petty cash books. In addition to recording cash, bank and VAT transactions, you can enter credit sales and purchases, and for all these entries the program will automatically complete double entry routines, to ensure your records are always in balance. **£59.99**



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Amiga Shopper Show imminent

The UK's only show dedicated exclusively to the Amiga is about to happen. The place is Wembley Exhibition Centre and the time is May 15-17. Tickets are still available for £4.95 from our hotline on ☎ 051 356 5085 (entry will be £6 on the day). Advance bookers will receive a free show guide!

For more details of why this is going to be the greatest show on Earth, turn to page 136.

NEW SOUND SAMPLER

A new sound sampler, the Beat Studio, has been launched by City Beat, creator of the software for Pandaal's hand scanner.

The package consists of a cartridge which plugs into the Amiga's parallel port and accompanying software. Sound can be taken in stereo from a variety of sources, including CD players, Walkmans and tape recorders.

Sampling can be done in stereo (at 36KHz), mono (at 57KHz) or simulated stereo modes. The user can edit and mix samples and add effects such as echo, amplify and filter. Looping features are included to extend samples, and 9 samples can be linked together to create a song. There is also a facility to grab sound samples from games.

The Beat Studio costs £39.95 from City Beat ☎ 0234 857777.

New details on A600

Further details of Commodore's latest Amiga, the A600, have emerged.

Contrary to what was said in our report last month, Commodore's CD-ROM drive, the A570 will not plug into the side of the A600. The side expansion port has been completely replaced by the smart card slot. It would be madness for Commodore to release a new Amiga that was incompatible with CD technology; rumours are therefore rife at the moment that the company plans to release a version of the A570 specifically for the A600.

Steve Franklin, Managing Director of Commodore, offered the following comments on the new machines: "Ever since its launch in 1985, the Amiga has been subject to a program of constant improvement and evolution, designed to keep it safely in its position of market leader. This latest range is a giant leap forward, giving the user state-of-the-art computing power at an affordable price."

These words have struck many industry figures, disappointed with the timid specifications of the A600, as ironic. The A600 boasts no real improvements over the A500 Plus, which was released late last year. It has a built-in TV modulator and hard disk interface, but these offer no improvements in computing performance.

The use of surface mounted technology, although reducing Commodore's costs, gives the end user no pay-off. The slot for smart cards, touted as a step against piracy, has been greeted with ambivalence by developers. In an article published by the trade newspaper CTW, spokesmen for companies such as Ocean and Domark were adopting a 'wait and see' attitude regarding the prospect of releasing software on a smart card format.

The A600, along with Commodore's A570 CD-ROM drive, will be given its UK consumer launch at the *Amiga Shopper Show*. Check out stand A50.

MOUSE FOR THE KIDDIES

Logitech introduces a mouse with a friendly face – the Kidz mouse. Now you'll never be able to get your kids away from the Amiga



Logitech has released a mouse designed specifically for children.

The Logitech Kidz mouse is shaped as much as possible like its mammalian relation, is coloured grey and has two buttons for its ears. The cable represents its tail. Although physically smaller than an ordinary mouse, the Kidz mouse retains the sensitivity of the others, with a resolution of 200 dots per inch.

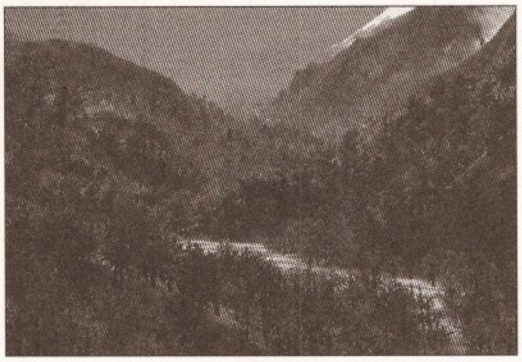
The product is aimed at 5 to 11 year-olds to encourage their familiarity with computers. A birth certificate is included with each mouse so that the child can name it. The Kidz mouse costs £37.60 from Logitech ☎ 0344 891313.

NEW VISTAS OF FRACTALS

A new, much enhanced version of *Vista Pro*, the fractal landscape generator, has been released by Virtual Reality Labs.

A number of new features have been added to version 2. It now supports user definable backgrounds and foregrounds. Oak, pine, palm, cactus, and sage brush trees can be added in varying mixes and densities. Buildings and roads may be added to the landscape, and the sky can be given a sunset effect.

The program costs £69.95 from HB Marketing ☎ 0753 686000. Those users who got *Vista* from the *Amiga Format* cover disk can upgrade for £39.95. Virtual Reality Labs is on ☎ 0101 805 545 8515.



Create stunning images like this one with the aid of fractals and Virtual Reality Labs' Vista Pro 2

PHILIPS IN GREY MONITOR SHOCKER

A furore erupted after the publication of an advert by Diamond Computing in last month's issue.

The advert, headed 'Did you get a shock last Christmas', claimed that nearly 20,000 Philips monitors had been unofficially imported into this country by retailers. The advert further claimed that these monitors were electrically unsafe.

Like a bolt from the blue, Philips responded with a statement to *Amiga Shopper*. It said:

'The advertisement has caused considerable public concern, and we'd like to make clear to your readers that, while the monitors are not designed for the British market, they do not pose a risk for users so long as the user ensures that a British power lead, correctly earthed, is used.

'Purchasers of the grey imported monitors, identifiable by the product codes 10G or 20G, may find that they lack a British power lead and will have to ensure that they properly earth the monitor when changing the power lead before use. Users will also certainly miss out on Philips' one year on-site warranty support and of course not receive the free F-19 flight simulator games software which is included with every UK version of the CM8833 monitor.

'All genuine UK monitors have the product codes 05G, 55G or 65G and fully comply with either the British Safety Standards BS415 or BS7002 as well as being approved by BEAB.

'We hope your readers will appreciate the extensive benefits of buying a genuine UK Philips monitor, and are reassured on the issue of safety for all Philips monitors on the market.'

PLAY BY MAIL

A multi-user game in which players make their moves by post is being set up on two Amigas by Phantom Designs.

Players participate by sending their moves into the company by post; these are then processed by computer and the results are sent out to the players in the form of reports. Several hundred players may participate at once. The game itself is a mixture of rôle-playing and strategy.

Phantom Designs was set up with the aid of the Government Enterprise Allowance Scheme. The equipment it uses to run the game includes two Amiga 500s linked via a serial cable, a GVP series II 105Mb hard drive, *PageStream*, *DPaint*, and AMOS.

The joining fee is £6.50; subsequent turns at the game costs £2.50 each. For more information call Phantom Designs ☎ 0602 222329.

STEP INTO THE SHADE

A new release from Meridian Software will be of interest to *PageStream* users. *Shades* is a collection of object-oriented clip art which provides smooth gradient fills.

The disk contains 25 different shapes and styles for use with SofLogik's *PageStream* desktop publishing package. Because they are object-oriented, the clips can be re-sized, rotated, twisted and so on without introducing jaggies. They use *PageStream*'s step screening facilities to achieve gradient fills of 100 steps.

Shades costs £59.95 from Meridian Software ☎ 0533 896743.

FROM BULGARIA WITH LOVE

Bulgaria is Europe's leader in computer virus production, it was claimed at the 5th Annual Computer Virus & Security Conference.

At the conference, Vesselin Bontchev, director of the Laboratory of Computer Virology at the Bulgarian Academy of Sciences, described viruses as 'Bulgarian freeware'.

A number of reasons were given for this phenomena, including: low payment of programmers coupled with wide-spread piracy; poor legislation against the creation and distribution of viruses; and the fact that virus victims consider themselves the butt of a joke rather than a crime.

A new age in Sunrize sampling software dawns

DIGITAL AUDIO TO DISK

The long-awaited digital sampling system from Sunrize has finally begun shipping.

The package consists of a 12-bit resolution digital audio card, the AD1012, and *Studio 16*, the bundled software. The card fits an A1500/2000/3000.

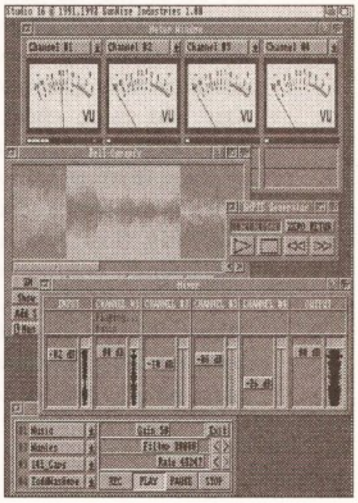
The card can sample at up to 100,000 samples per second, recording direct to hard disk to create very long sounds. Both an input and an output filter are provided to prevent aliasing (the effect of high frequencies outside the sample range distorting those frequencies being sampled). The card can simultaneously play back four channels of sound.

Also included is the facility to synchronise with video tape via the SMPTE time code standard. Complex multi-track cue lists can be created with the *Studio 16* software. Full facilities are provided for editing existing samples on the hard disk.

Included in the hardware is a digital signal processor, which provides for digital effects, such as flanging, chorus and echo, in real time.

This is the first of two audio cards planned by Sunrize. The next will have 16-bit resolution. Other developers, including Blue Ribbon Sound Works, are currently working to provide support for the Sunrize sound cards.

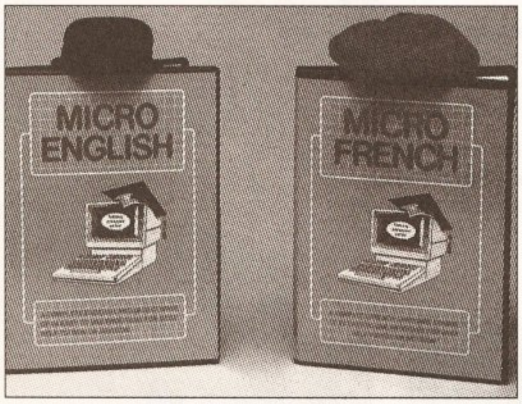
Sunrize is on ☎ 0101 408 374 4962. The AD1012 costs £399 and is distributed in the UK by HB Marketing ☎ 0753 686000, which will be exhibiting at stand D16 in the *Amiga Shopper Show*.



Sunrize's *Studio 16* combines an attractive display with facilities to edit, play and sample digital sounds

NEW WAVE OF EDUCATION

Education specialist LCL has released new versions of its *Micro French* and *Micro English* program for the Amiga.



Parlez-vous Franglais? You will be able to after a few sessions with *Micro French* and *Micro English*

The programs have been re-written to comply with the latest National Curriculum and GCSE directives. The programs are augmented with sound and colourful, animated graphics to encourage student motivation

Micro French takes the student from complete ignorance of the language up to GCSE standard. Topics covered include verbs, grammar, vocabulary and spoken French.

Micro English, which covers reading, writing and speaking, takes eight year-old students from beginners right up to GCSE level.

Both programs cost £24 (plus 99p postage) and are available from LCL ☎ 0491 579345. Owners of older versions can obtain an upgrade for £5.

THINK AGAIN

***Thinker*, the hypertext system from Poor Person Software, has received an update to bring it into line with CD-ROM technology.**

The new version enables users to deal with CD-ROM databases as hypertext files. A separate update file is kept on floppy or hard disk to keep a track of the changes made to the original database.

Hypertext works by creating links between important words in a document and relevant sections of text elsewhere. The new *Thinker* enables the user to create links between the main database and other, separate ASCII files.

The update is available to existing users for $15. Users of version 1 can obtain an update for $25. The latest version of *Thinker* costs £80 from Poor Person Software ☎ 010 1 415 493 7234.

GET INTO PRINT

Amiga owners wanting to get full colour prints of their artwork will be pleased to learn of the service being offered by Digicopy.

The company will produce prints at up to A3 size for £3. Subsequent copies of the same print cost £1 each. Digicopy is on ☎ 0634 572688.

CORRECTIONS

The advert last month for Option 2000 was printed with an incorrect phone number. The correct number is ☎ 0623 720659.

In last month's education column we omitted to mention that TouchWindow is available from Think Limited on ☎ 021 384 4168.

DIARY DATES

May 15-17: Amiga Shopper Show. Wembley, London. ☎ 051 356 5085.

May 16: All Formats Computer Fair. Horticultural Hall, London. ☎ 0225 868100.

May 17: Computer Technology Fair. Norbeck Castle, Blackpool. ☎ 0273 607633.

May 17: All Formats Computer Fair. Brunel Centre, Bristol. ☎ 0225 868100.

May 30: Computer Technology Fair. St. Andrews Hall, Norwich. ☎ 0273 607633.

Talking Shop

Welcome to your letters page – the only place to be if you're serious about your Amiga. If you've got a view then send it to: Andy Storer, Talking Shop, Amiga Shopper, 30, Monmouth St, Bath, BA1 2BW

FULL MOTION CDTV

I have heard Philip's CD-I, the supposed equivalent of Commodore's CDTV, is to upgrade its machines to accept "Full video", meaning full length feature film, on 12 centimetre compact disks. The new CD-I will be ready for production next spring in the US.

This might mean Philip's CD-I completely wiping out sales of Commodore's CDTV.

There is no doubt Commodore is fully aware of the new CD-I. The question is whether it will do the same for its CDTV, or will it be discontinuing production of CDTV and ignore CDTV owners, as it is planning to do to A500 owners?

YK Au
London E15

Full motion video (FMV) is still some eighteen months away on any CD machine since it relies on massive compression/decompression rates.

The exact algorithms handling these are still the subject of a debate within the Motion Pictures Expert Group (MPEG) – a subset of the International Standards Organisation (ISO). Given that no manufacturer worth its salt is going to embark on a non-standard image compression format, everyone is waiting for an agreed standard to be adopted across the board.

Hence all there is out there at the moment are prototypes running on custom chipsets. You can bet Commodore has its own waiting in the pipeline to upgrade CDTV and the A570 to FMV once an international accord has been reached.

Meanwhile let's just see how well CD-I shifts in the shops.

A2000 PLUSES

Will CBM be releasing ECS A2000s, or will we have to wait until someone opens a box to find an "A2500" or something in place of its A2000?

I have had an A500 for about 4 years, still with Kickstart 1.2, WB1.3, and an A590, but am also going to be buying a basic CAD system for work. I cannot be sure though that the A2000 will be supported in the future (Commodore certainly shows no desire to keep existing customers happy).

So I fear I will have to purchase an inferior IBM-based system, purely because I can be confident of good quality support. Why, oh why does CMB insist on treating us like idiots, or as if all we bought the machine for was to play games?

It is very difficult to defend the Amiga as a serious machine when it is still based on the original 68000 chip at 7MHz, compared with IBMs, which I think, have had three or four CPU updates in the same period.

How much could it cost to bring out an A2000 model C with WB2 and ECS, based on a 14MHz 68020, instead of making the user tear his/her machine apart and wire in third-party upgrades?

If there was an official upgrade facility which offered guaranteed compatibility, and future support, I'm sure that many (new) professional users would pay for it. Am I right?

Niall Davies
Edinburgh

The easy answer is that CBM hasn't made an official pronouncement on an upgraded A2000. So we can only take an informed guess as to what they're up to behind closed doors. While rumours persist of a 68020-based A2000 model, CBM won't comment on the matter – either on or off the record. And, therefore, I don't think it would be a good idea for me to go on the record either way (Off the record though – and remember you never read it here and I hereby deny all knowledge of ever saying it – I reckon it'll phase out the A2000 and offer trade-in deals).

All I can suggest is that in the meantime you should shop around for an A3000.

2000 OR 3000 AMIGAS?

It is the second time I have bought *Amiga Shopper*. And now I can say it is excellent. In Germany we don't have any really serious Amiga mags. I mean they all include game testing and game previews.

Now my question is, I plan to buy later in this year an Amiga 2000 or 3000. I read in Amiga Shopper and in a German magazine that Commodore will sell newer A2000s.

Do you know anything about them, I mean when Commodore starts to ship the new ones with 16 bit sound and 68020 processors? Excuse me for this bad language style, because I hate grammar.

Stefan Muller
Kaiserslautern, Germany

Oh Stephan, what we ran last issue were our ratings of the rumours of a whole bunch of new Amigas supposedly in the pipeline. I'd be interested in seeing any directly attributable quote from a CBM executive who claims theres'a new 2000 on the way though. Send me a clipping...

WHO NEEDS 24-BIT?

With regard to the DCTV review in April's *Amiga Shopper*, who really needs 24-bit colour anyway? In truth, nobody.

The fact is, a standard PAL monitor has a resolution of 640 x 256 pixels, a total of 163,840 pixels in all. Supposing that the Amiga, using 24-bit colour, is displaying a picture in which each of these pixels are a different colour (and it rarely, if ever *does*), then less than a hundredth of the 16,777,216 colours possible with 24-bit colour are used.

In other words, 24-bit colour doesn't mean that you have all 16,777,216 colours at your disposal for use on-screen, but instead you merely have a *palette* of this amount of colours.

Another problem limits 24-bit colour even further. This is the colour perception of the average human eye which needs a 1.5% change in any given colour in order for the viewer to perceive a noticeable difference.

I come to a conclusion; 24-bit colour is just a very expensive 'toy', and 18-bit colour, in my opinion, is perfectly adequate and forms a cheaper, more practical alternative to 24-bit, leaving 262,144 colours to play around with.

So, in fact, the 24-bit power of Ham-E, DCTV, the Harlequin, etc are just unnecessary luxuries.

Stuart Reid
Nelson

Unless, of course, you're into broadcast-quality graphics and have a multi-sync monitor at your disposal. Then, 24-bit colour is absolutely essential because lower resolutions just look naff.

IMPORTING AMIGA PICTURES THE INGENIOUS WAY

I have come up with an idea that may be of use to some of your readers who like me wish for an easier way of getting pictures into their Amigas. I'm talking about getting accurate pictures and not ones merely traced using a mouse with a bit of plastic stuck on the side (*– Don't you talk about our Tracey like that or I'll send our Dad round* – Ed).

What surprises me is that most of us have the required materials to hand and that no one in the DTP world has mentioned it before.

What you need is a fine overhead projector pen or similar – permanent or water soluble, a transparent loose leaf insert (for an A4 ring binder) and a picture.

All you need to do is this: cut the loose leaf insert into two sheets of A4, place one over the picture and trace it, place this insert on to the monitor – static should be enough to hold it, if not breath on it – and trace the outline using your mouse!

Once a little practice with using line and curve tools is gained then the process speeds up dramatically.

M D Rennie
Herts

I haven't had chance to try this myself but I'm sure it's a neat idea. Thanks!

CORRECTING HYPE

Many congratulations on an excellent magazine! I have read every issue and many a happy hour is spent with each new one.

This month I must however leap to the defence of *HyperBook* by Gold Disk. In reply to Paul Matthews in May's 'Amiga Answers' you say that 'the workscreen is restricted to NTSC mode only'. This is simply not true.

I have used *HyperBook* happily

continued on page 14

continued from page 13

for several months and always in full PAL mode. So that shouldn't be any bar to Mr Matthews buying it.

I agree with the remainder of the answer, although I find that *HyperBook* is much easier to use in producing multi-media application/decks, although it is let down by not being able to play animations or sounds without reference to external programs

Mike Dodson
Brighton

I can't imagine how we managed to slip up there Mike – well spotted.

HERR OBEREDITOR

Why is it that only the editor gets an actual photograph printed at the start of his column, while the rest of the team have to put up with a hand sketched look-a-like?

Come on lads and lassies, get out the placards – "Real photos for real people", "Give readers our true image" and so on. After all, poor old Jason Holborn doesn't look too healthy in the photograph presented along with his review article covering *Stereo Master* in the March issue.

Ronnie James
Alloa

Jason Holborn doesn't look too healthy in any case. The only reason I have my photo upfront is that my mother lives 3,500 miles way and this is the only way she can rest assured I'm looking well and eating properly. Actually though, we sent off a quid to all our contributors at Xmas saying 'go down the bus station, jump in a machine and get your mug shot'. They all just pocketed the money. Typical.

BUBBLING THROUGH

I have been reading your magazine since issue 1 and have enjoyed and learnt much from each issue. The point I am writing about is that in your Amiga Answers pages a lot of people have been enquiring about the Canon BJ-10e bubble jet printer.

I feel a lot have been put off by printer driver problems, as the BJ-10e only supports IBM Proprinter and Canon BJ-130e emulation. This can be got round by using a Canon 48 driver obtainable from a number of computer suppliers.

My word of advice to those thinking of buying this marvellous little printer is to go ahead, but to buy the BJ-10ex. This little baby looks exactly the same as the BJ-10e but it also supports Epson LQ emulation, so you can use the EpsonQ driver on your Extras disk.

Perry Tatman
Lee-On-The-Solent

Cheers Perry, I agree the BJ-10ex is a great little printer – expect to see a full review soon.

KEYBOARD CAPERS

Can you explain why Commodore has mixed up some of my keys? On my A500+ the quotes above the number '2' key are above the hash sign. However the hash sign really is not on its proper key either, it is on the number '3' key; the @ is above the '2' key, and I don't have a '£' sign! (phew).

Lee Brown
Motherwell

Phew indeed! This is known as the Commodore Dimensional Transitory Vortex, Lee, and is a well known feature of certain A500 Pluses designed to induce despair in certain carefully selected users. You should move to the USA immediately and undergo psycho-analytic counselling. Meanwhile, can any other readers help out?

BEST PEST TIP

Firstly, I would like to say how great I think it is that your magazine is publishing useful programs written in DOS and ARexx which do not require additional expensive software. A number of Amiga owners I have met complain about the cost involved in buying or writing utility programs in both time and money.

This only goes to show the little understanding that many computer users have for the power in AmigaDOS and ARexx, as much can be written using the programs supplied on Workbench. I have just finished playing around with the little AmigaDOS routine listed in *Amiga Shopper* Issue 13 called "Pest".

Although I now have an Amiga 3000, it was not that long ago that I was working with an Amiga 500 version 1.2 with two disk drives. I, therefore, still remember the problems associated with there not being enough room on my Workbench Disk for the extra programs I wanted access to. This normally resulted in deleting programs that were not normally required (from a copy of the Workbench Disk!,) eg ED and EDIT in the C:directory.

This would make the potentially useful "Pest" program unusable. However, this is not the end of "Pest", as by making use of other AmigaDos 2.0 facilities "Pest" can live on, be smaller and work quicker. By replacing the first three lines with the following:

```
ECHO > ENV:Temp "'DATE'" ↵
len 18
ECHO > ENV:now "$Temp" ↵
first 0 len 9
ECHO > T:pf "= = Reminders ↵
for:$now= =*n"
```

NOTE: The "'" character is produced by pressing "Alt'" (The key above the TAB key). This results in the output of DATE being placed between the "" for the ECHO command to work with. The extra characters produced by DATE are stripped by ECHO in two stages (see manual).

I hope this might be of interest.

Alan Munday
Bath

Thanks for that little tip Alan, and let's hear it for the first listing ever to appear in the letters pages of *Amiga Shopper*! Talking of listings, we've had a couple of dozen or so sent in for the new listings pages on 134-135. So keep 'em coming – we're after anything and everything and we'll pay you £20 for your troubles. Just send your code on a disk to 'Listings', *Amiga Shopper*, 30 Monmouth St, Bath BA1 2BW.

IMPORTER WANTED

What is happening with the German raytracing program "Reflections", made famous by the amazing art of Tobias Richter?

I have been waiting for an English translation of this program to appear for about 18 months now. Gary Whiteley indicated several months ago that he had a copy of the German version, and would review it very soon as had had a lot of contact with the publishers. but nothing further has appeared.

I phoned Markt & Technik in Germany, eventually spoke to someone directly involved with the program and was told that it had had no success in finding a company who would market an English version. Surely there must be some company in Britain which would market an English version of this program. Reflections has the potential to become the leading Amiga raytracer. It is far cheaper and produces much better results than any of the competition seem to. Could you use your weight as one of the leading Amiga mags to try and get this situation sorted out? Surely you can find a company which would handle distribution? It certainly would be worth the effort to get this brilliant program on to the market.

Alexander Kerr
Downton

OK guys – anyone out there listening? We'll see what we can do.

CHOOSING A WP

I am at present trying to decide which new word processor to buy. The problem is that there are so many on the market today with similar features that it is extremely difficult to compare them, when retailers give (have ?) so little information about them.

What I'm after are the following features: not too expensive, ie less than £100, graphics import either IFF or HAM, scaleable fonts 'Built in', columns (max 5), will run from floppy disks, text to flow around graphics, output to Preferences printer in colour and a spellchecker and thesaurus.

Would it not be possible to publish comparison charts of similar serious software listing all the major features?

Tony Hawker
Blandford Forum

A good idea and one which we will be taking up. Meanwhile, catch next month's main article which will show you how you can get hold of most of your required word processor features from the public domain! AS

IF ONLY I'D REALISED...

CONTINUING OUR SERIES OF HANDY TIPS BRINGING YOU THE BENEFITS OF HINDSIGHT...

I have had my Amiga 500 for some three years now and have been very happy with it until now. Last month, however, I purchased a Commodore 1084S monitor. Then when I tried to set it up, I noticed that the screen started to flicker and shake when my external disk drive was accessing data.

I phoned the computer shop and it told me that it could be my external disk drive or my power supply unit. Turns out it was the power supply.

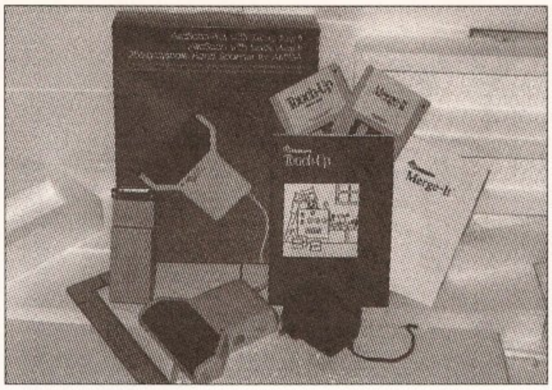
I have it some 3ft away from my Amiga so my problem was not solved like Brian Wadge's in the last issue. Luckily my computer shop exchanged it for another model.

RJ Marshall
Stockton-on-Tees

Seems like there are a few different types of power supply out there and some are better than others. Although Amiga PSUs tend be rather expensive you can use a PC unit if you're absolutely confident about dealing with compatible voltages. But beware, the results could be fatal if you er...blow it. And in any case, never work with a PSU with the power switched on – always wait a good minute or two after you've powered down beforehand.

Meanwhile if any other readers can pass on tips learnt from problems experienced and overcome then just send them to: " I can laugh about it now", *Amiga Shopper*, 30, Monmouth St, Bath BA1 2BW.

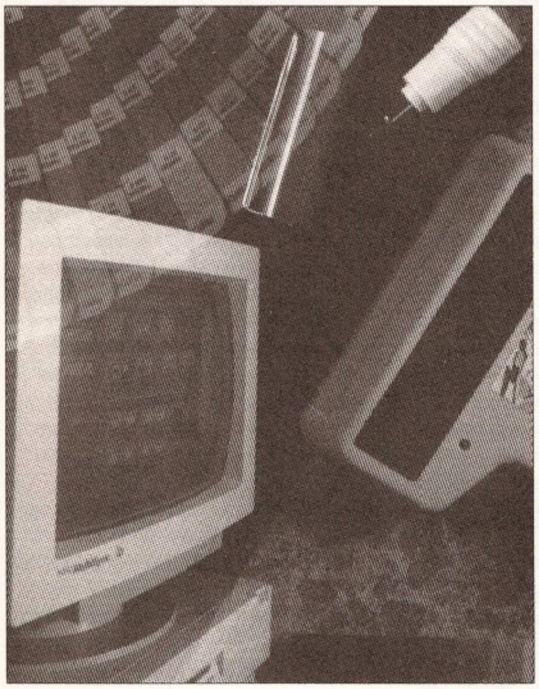


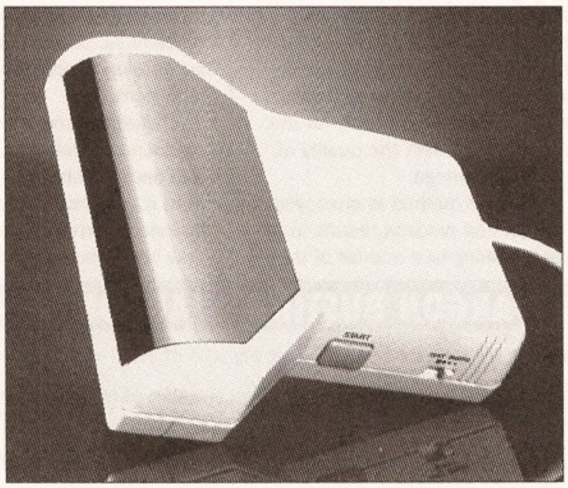




SCANNED

by your man





Jeff Walker looks at which features you should look out for when buying a hand scanner and reviews five models which fit the bill...

If you want to transfer pictures from paper to your computer screen, and from there to disk and printer, a hand scanner is the quickest and cheapest way to do it. The price you pay for this comparatively inexpensive solution is loss of colour and loss of image resolution; trade-offs which are nevertheless worth considering.

If the resulting images are to be used for some kind of desktop publishing, and if you are printing on a monochrome printer, then loss of colour won't matter, will it? And as the highest resolution of your printer is something like 240, 300 or 360 dots per inch, the loss of image resolution doesn't matter either because even if you could grab an exact photographic resolution scan of the original, the quality is limited by the top resolution of your printer.

So for this particular application – getting images off paper on to disk for importing into desktop publishing or word processing packages, where they can be rotated, rescaled, and positioned freely on the page, then printed on your monochrome dot-matrix, inkjet or laser printer – monochrome hand scanners are the ideal solution. Anything more would be overkill. But to be useful for DTP, the images generated and saved by the scanning software have to have certain properties. The initial image produced by the software is of limited use – a massive black-and-white bitmap which is typically about 1,200 to 1,600 pixels wide and up to about 4,500 pixels high.

This bitmap is constructed of groups of pixels called 'grains'. A scanner generating 64 levels of grey creates grains that are 8 pixels wide by 8 pixels high, 64 in all; the pixel pattern contained in each grain represents a single shade of grey; solid white would be 64 white pixels and solid black would be 64 black pixels. In scanning jargon we call this black-and-white bitmap the 'dither', because it is an image made up of patterns of black and white pixels, as opposed to true greys or colours.

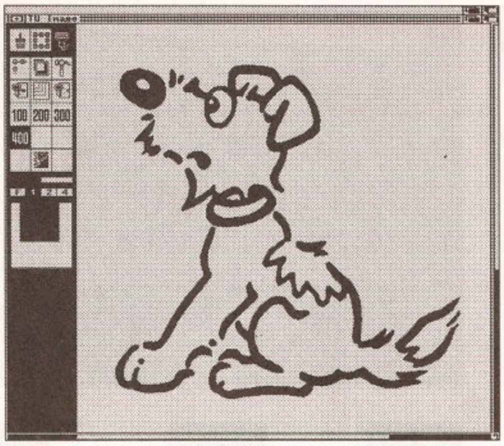
DITHERING ABOUT

There are several reasons why the dither is not much use to monochrome desktop publishers. First, when created using the 'halftone' setting on the scanner head (the smallest dot) it contains patterns that represent 64 levels of grey, but our printers – even high resolution inkjet and laser printers – will have trouble reproducing more than about 20 that the human eye can see the difference between. This means that many of the subtle changes in tone will be lost unless we scale the picture so large that the individual pixels in the grains are discernible in the printed output.

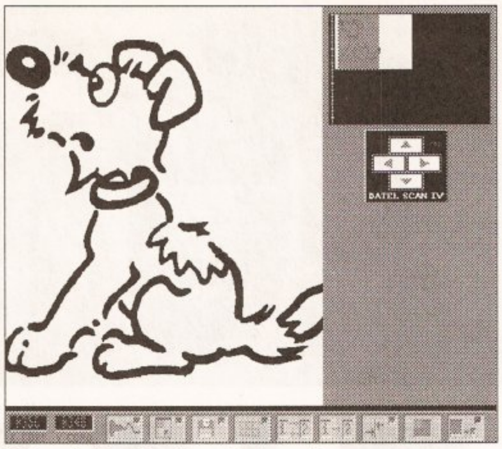
But the main problem is that because the size of the dither is so large we have to scale the bitmap down to something like 25 per cent to get an image on the page of approximately the same size as the original image scanned from paper.

In itself this isn't a problem, apart from the fact that the massive bitmap takes up a lot of memory and the scaling process takes time; the

Scans for the memories: the hand scanners pictured clockwise from top left: Handiscan from Datel Electronics, AlfaScan Plus from Golden Image, Daata Scanner from Pandaal Marketing, Handy Scanner from Zydec and Power Scanner from Power Computing



The line art images created by the AlfaScan Plus never suffer from the corruption which some of the other scanners produce at 400 dpi



Although the Handiscan's line art scans are arguably the best of the lot, the ridiculous height restriction of 1,024 pixels means it is of limited use to the desktop publisher



The DaataScan scanner corrupts 400 dpi line art scans with short horizontal black and white lines, however at 300 dpi and below scans are glitch free

real difficulty is that to increase their dots-per-inch resolution, most printers overlap the dots produced – even if a printer says it has a resolution of 360 dots per inch, this doesn't mean that each dot is 1/360th of an inch wide, far from it; even laser printers overlap dots.

Can you see that if the printer starts to overlap the dots in the dither, then the patterns in each 8 pixel by 8 pixel grain of the bitmap are not being printed correctly? What actually happens is that you get weird and unacceptable patterns in the output.

So the black-and-white dither is only useful for images created using the Text or Line Art setting – this type of image contains no grains and so will not suffer when scaled down, unless it just happens to contain an intricate or regular pattern because the original does too.

SHAPING UP THE SHADES

For greater flexibility of halftone images we need to be able to convert the dither to a true greyscale image.

The standard Amiga can produce only 16 true shades of grey – on the RGB values scale these are 0,0,0 (black) to 15,15,15 (white), so the software has to employ a certain wizardry to change 64 dithered levels of grey into 16 true greys.

How it achieves this will be down to which algorithm the programmer has decided to use. The simplest method is to read the dither in 4 pixel by 4 pixel grains (instead of 8 by 8), count how many white pixels there are in that 16-pixel matrix, and then create one true grey pixel of that RGB value. For instance, say a 4 by 4 grain contained six white pixels (and therefore ten black ones), it will convert that grain it to a single grey pixel whose RGB value is 6,6,6 – a darkish grey.

A more complicated method would be to convert each 8 by 8 grain of the dither into a 2 by 2 matrix of true grey pixels; by clever mixing of the 16 possible greys it is possible to represent in this matrix all 64 levels of grey – in high magnification you will be able to see that there are only 16 actual greys, in normal magnification the pixels are so small that the eye is fooled into seeing more.

The patterns in the grains of the black-and-white dither are produced by the scanner head, so there's nothing the software can do about them, but the conversion to greyscale is very much in the software's hands and the method used for the conversion will affect the quality of the greyscale image.

Whichever method is employed, the conversion process results in the image shrinking to a quarter of the size of the dither – a 1,600 pixel wide dither comes down to a 400 pixel wide greyscale.

This greyscale image is preferable for monochrome DTP as it contains only 16 shades of grey, and most monochrome printers will be able to represent these shades adequately. But the image needs to be fairly bright because towards the dark end of the scale the difference between greys becomes less discernible, so the quality of the conversion to grey routine is all-important.

Having learned how a monochrome hand scanner works, and decided what results we require from it, it's time to look at the scanners currently available to see if they come through with the goods.

JARGON BUSTING • JARGON BUSTING

24-bit ILBM – A picture file format capable of 16.7 million colours.

Bitmap – The internal computer representation of an Amiga graphic, a memory map of bits (0s and 1s).

Clipboard – A temporary area of memory which can either be scanned to directly or to which parts of the main work area can be moved to and fro for cutting and pasting etc.

Dither – In the context of this article, the name given to the initial black-and-white picture produced by the scanner.

DPI – Dots per inch, a measure of resolution.

Grains – The parts of a dither which contain the patterns representing levels of grey.

Greyscale – An image consisting of true shades of grey rather than dithered black-and-white representations.

Halftone – Photographs or artwork broken up into fine dots.

ILBM – The standard Amiga picture file format, capable of displaying up to 4,096 colours, but only 16 true levels of grey.

Imagesetter – A lump of machinery which costs a lot of money. It's what the pages of this magazine are produced on ready for reproduction.

Line Art – Artwork that contains only two colours, usually black and white.

Monochrome – 'Single colour' not 'black-and-white'. Monochrome printers for example produce only one colour of dot, usually black ones.

TIFF – A picture file format used mostly by DTP software, capable of 256 true

HARDWARE

One piece of hardwarel was not able to include in this round-up is the much-advertised Naksha Amiga Hand Scanner; at the time of going to press the software was going through a major rewrite and despite several phone calls the company was unable to provide me even with the current version. Sorry.

Hardware-wise all five scanners are fairly similar. The scanning head itself is (currently) in all cases the Marstek M-105 Plus, although one or two companies have re-badged it with their own company logos. The interfaces all plug into the parallel port, and all come with separate power supplies. Points to note are that the DaataScan and Handiscan interfaces plug directly into the parallel port, whereas the AlfaScan Plus, Handy Scanner and Power Scanner interfaces have short cables which enable the interface to be lifted on to the top of the computer; which may be important to you.

Only the Power Scanner has addressed the problem that you may want your printer plugged into the parallel port at the same time as the scanner; the Power interface has a throughport to which your parallel printer cable can be connected, although the power supply must be connected to the interface and switched on to be able to access the printer, even if you are not using the scanner. This isn't a problem, I've had the Power Scanner's power supply and interface plugged in for about four months solid now and it isn't even slightly warm.

With the other interfaces, if you need this dual scanner-printer facility you will have to buy a separate parallel port switch box.

All of the interfaces except the Handiscan's are of an adequate build quality – the Handiscan interface has part of the printed circuit board poking out the back on which the connections for the power

supply and scanner are mounted; works fine of course, looks a bit Heath-Robinson though. One final observation is that the power supply unit which comes with the Handy Scanner doesn't have a 13-amp plug on it, all the others do.

AlfaScan Plus	●●●●○
DaataScan	●●●○○
Datel Handiscan	●●○○○
Handy Scanner	●●○○○
Power Scanner	●●●●●

FACILITIES

The big differences between these five scanners is the performance of the software. I don't mean the speed at which it scans or operates, I mean how easy or difficult it is to use and the number and power of the features available.

For the actual job of scanning, none of the scanners is any easier to use than any other. In essence they all work in the same way inasmuch as you first decide the size and resolution of the scan, then hit the scan button and pull the head slowly over your picture.

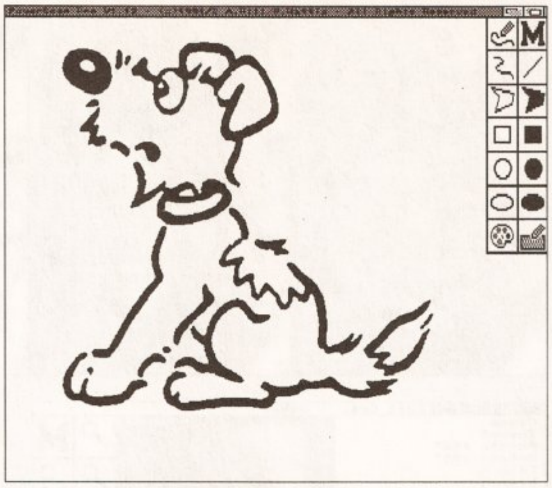
One package, however, places a restriction on the maximum size of the scan – Datel's Handiscan. This software only allows you to scan a maximum of two hi-res screenfuls, that's 1,024 pixels. It doesn't take an Einstein to work out that at the maximum scan resolution of 400 dots per inch this converts to about 2.5 inches; at 100 dpi it would be just over 10 inches. So what if you want to scan, say, a five inch high picture at 400 dpi? With Handiscan, you'd have to drop to a lower resolution, in this case 200 dpi.

All the other packages decide on the maximum allowable size of scan by either automatically looking to see how much memory you've got or by allowing you to specify a maximum scan buffer size.

At this point I hear all the owners of Power Scanners screaming in one voice: "Oh no they don't!"

Aha, but they do! Power Computing is developing version 2 of the PowerScan Professional software as I write, and one of the new features is the ability to automatically scan to expansion (Fast) memory if available, instead of the just graphics (Chip) memory restriction in version 1.

Power Computing was kind (brave?) enough to send me a pre-release copy of the new software, and my comments regarding PowerScan Professional will be based upon what I have seen and what the programmer has told me will be implemented in the final release of version 2. Power has asked me to pass on the news that current owners of the Power Scanner will be able to upgrade to PowerScan Professional 2 free of charge if they send back the original disk and a stamped addressed envelope. By the time you read this version 2 should be shipping.



The Power Scanner also corrupts 400dpi line art scans with glitches, but an automatic image processing feature gets rid of them at the touch of a button



Handy Scanner isn't so handy at 400 dpi, covering the image in glitches which have to be removed by hand in zoom mode

VITAL STATISTICS

Every package has facilities for specifying the width of the scan. The AlfaScan Plus software (Touch-Up) has just two choices, half width or full width, all the others allow you to specify a particular measurement.

Touch-Up and the software that comes with DaataScan and Handy Scanner allow you to set up a particular size 'page' on to which to scan. So for instance you could specify an A4 size page and employ the clipboard to scan images directly on to particular positions on the page. The amount of memory a page requires differs according to its physical size and what scanning resolution you have chosen – while an A4 page at 100 dpi needs about 120,000 bytes, the same size page at 400 dpi uses up about 2Mb, so you shouldn't get excited about this, unless you have stacks of memory.

You can of course simply scan to the page, rather than the clipboard, in which case the size of the scan becomes the size of the page.

Touch-Up allows you to change the size of the page at any time without losing what's on it, the DaataScan and Handy Scanner software will let you change the page size but whatever was on that page will be lost; you are warned about this, naturally, and asked to confirm before you destroy your image.

The Power Scanner 'page' is always dictated by the height and width of the scan. If you specify a scan width greater than the width of the scanner head, this area will be left blank after the scan has completed, but you will be able to scan to the clipboard and subsequently place the contents of the clipboard in that blank area if you like. In this manner the Power Scanner gives you the ability to scan a wide picture in two vertical halves and visually join the two halves together on-screen.

The Handy Scanner and DaataScan have no special facilities for joining two halves of a scan together, but it is possible by scanning the left-hand half on to the main page, and then dragging out a clipboard or 'current area' to the right of that image and scanning the right-hand half into that. I tried it a few times and couldn't even get a close match let alone an exact one – you need to be extremely precise with positioning the scanner head.

The AlfaScan Plus comes with a separate program called Merge-It which allows you to load in the left-hand and right-hand dithers (the big black-and-white bitmaps), visually join them together on-screen, and then save the result as a single image.

STRAIGHT AND NARROW

I should emphasise that it is very difficult to get good results by scanning wide pictures and joining them together in this way. Even with tons of practice you really need a proper scanning tray to ensure that the scanner head is perfectly straight for both scans. If you intend to scan a lot of pictures wider than four inches, a hand scanner may be a false economy, you probably need an A4 flatbed scanner.

One final point I should make here is that Zydec's Handy Scanner comes with an earlier version of the same software and interface supplied with the Pandaal DaataScan scanner – DaataScan Professional. There is one important difference between these two versions which I'll get to later, but in the meantime I'll leave you to ponder the reasons why a scanner which comes with old software costs £15 more than what is basically the same thing with new (and better) software.

AlfaScan Plus	●●●●○
DaataScan	●●●○○
Datel Handiscan	●○○○○
Handy Scanner	●●●○○
Power Scanner	●●●○○

BEST BUYS

FOR GREYSCALES – POWER SCANNER

It's dead easy to use and capable of stunning greyscale images provided the picture being scanned is of high enough quality, and while the facility to join the left half and right half of a wide scan is a fiddly and inexact procedure, with practice it becomes easier. The Power Scanner is also the cheapest; who says there isn't a god in heaven?

FOR LINE ART – ALFASCAN PLUS

The sheer power and range of Touch-Up's scanning, art and file format features, the Merge-It software that lets you join two halves of a scan together, the comprehensive 170-page manual... all these things make the comparatively high price of the AlfaScan Plus worth it if line art is your main consideration. What a shame its greyscale conversion is naff, otherwise it'd be the perfect Amiga hand scanner.

By the way, for another £140 there is a version of the AlfaScan Plus that comes with OCR software.



The results of converting a scanned halftone to 16 true grey levels; to the left is AlfaScan Plus, DaataScan in the middle and Power Scanner on the right



The Power Scanner is the only scanner package which enables you to zoom in and work on the greyscale image

LINE ART

Scanning line art is the simplest thing you can ask a monochrome hand scanner to do. I'd expect all the scanners to excel in this area. However this is not the case.

To make the best use of scanned line art we need to scale it down (using DTP software) to increase its output (printed) resolution. Quick explanation: the scanned line art is saved as an IFF ILBM file which has a resolution of 75 dpi; you want it to print at the highest resolution your printer is capable of, let's say 300 dpi; scale the image on your DTP page to 50% and you double its output resolution to 150 dpi, scale it to 25% and you quadruple its output resolution to 300 dpi.

Remember that scaling for output isn't the same as resizing a brush in an art program, where by halving its size you are removing every other pixel from the image. When scaling in a DTP program you are actually shrinking the size of each dot, so it is possible to get almost jaggie-free output of scanned line art. Provided, that is, the initial bitmap was big enough so that when it is scaled down it is not the size of a pinhead. To do this you need to scan it in at least 300 dpi if your printer has that resolution too, or 400 dpi if it has a top resolution of 360 dpi. This is where the problems start.

Datel's Handiscan restricts you to such a small height of scan at 300 and 400 dpi (two to three inches) that it is difficult to see how it can be taken seriously. But the quality is excellent. If you intend to use a scanner primarily for getting line art off paper into an art package for colouring in and subsequent use in a program or multimedia presentation or anything else to be displayed on the screen as opposed to being printed, the Datel Handiscan will do the job well. I'd go so far as to say that the Handiscan software has been designed with this application in mind rather than publishing.

THE NEED FOR SPEED

DaataScan and Handy Scanner have problems scanning line art at 400 dpi unless your machine is accelerated – both programs corrupt the images with short, horizontal black and white lines; the manuals blame this on the fact that the data is being transferred from the scanner to the computer at such a fast rate that the Amiga can't keep up. A classic case of a bad workman blaming his tools. If this *was* the reason then all the other scanners would suffer from the same problem – they don't. However both the DaataScan and the Handy Scanner work perfectly at 300 dpi and below, line art images' quality is excellent.

The Power Scanner also suffers from these 'glitches' at 400 dpi, but the version 2 software has a Cleanup feature that will process the scan and remove the stray black and white pixels. It works very well indeed and Power should be applauded for doing something about it rather than passing the blame. Again, the quality of the line art scans are excellent.

The four packages discussed above all do a 'realtime' scan – as you pull the scanner head over your artwork the computer image is built-up on-screen at the same time. The advantage is that you can immediately see if the scan is coming out too light or dark, and twiddle the brightness wheel accordingly. The disadvantage is that by taking your eyes off the scanner you may wander off the straight and narrow or pull too quickly. Swings and roundabouts.

The AlfaScan Plus is the only one of the packages that doesn't do a realtime scan. After completing the scan the software has a short think about it and then displays the results. There are never any glitches on 400 dpi line art scans, and the quality of the results is excellent.

Comparing like with like, there is nothing to choose between the quality of the line art scans produced at 300 dpi with each scanner. The real difference is that the Datel Handiscan appears over-sensitive to a jerk when pulling the scanner over the artwork, which can result in a black line across the scan. But with practice this problem goes away.

AlfaScan Plus	●●●●●
DaataScan	●●●○○
Datel Handiscan	●●○○○
Handy Scanner	●●●○○
Power Scanner	●●●●○

GREYSCALES

If you intend to scan halftones (photographs or artwork with more than two colours or shades of grey), you can forget the Datel Handiscan and Zydec's Handy Scanner because neither can convert the original black-and-white dither to a greyscale image. (The reasons greyscale is preferable to a dither were discussed in the introduction to this article.)

Only three of the scanners can produce greyscales – AlfaScan Plus, DaataScan and Power Scanner.

AlfaScan Plus gives you three choices, you can convert to a 16 grey level ILBM, a 256 grey level TIFF, or a 256 grey level 24-bit ILBM. Your guess is as good as mine as to how it produces 256 levels of grey from a dither that only represents 64 levels of grey – although the manual doesn't say so, I guess that while TIFFs and 24-bit ILBMs contain up to 256 shades of grey, only the 64 in the dither are present. In any case it's more than the 16 that a standard Amiga ILBM can contain.

Naturally you will not be able to view these greyscales in all their glory without extra hardware, but the files can be imported into DTP packages and printed without having to own a 24-bit graphics board. I tried the TIFFs with *PageStream*, and the output quality is excellent; the 24-bit ILBMs load into *PageStream* also, but the printed output was weird, covered in little white dots. Using *The Art Department* to convert an AlfaScan Plus 24-bit ILBM to HAM I got similar results. I've asked the Editor to publish a couple of '256 grey level' TIFF and 24-bit images so we can see what they look like when output by an imagesetter.

The 16 greyshade ILBMs produced by the AlfaScan Plus software look great in isolation, but held against those produced by DaataScan and Power Scanner, they appear muddy and blurred. The same is true of the printed output. It's a crying shame, Touch-Up is otherwise superb and I cannot understand why Migraph is having so much difficulty perfecting its convert to grey routine; it was poor in version 1 and still poor 18 months later in 2.62.

SHARP SHOTS

The battle for greyscale supremacy is between DaataScan and Power Scanner. Both produce sharp images that viewed in isolation look excellent. Put them together and compare them and there is no doubt that the Power Scanner greyscale images are brighter and sharper, and consequently show more detail.

On-screen the difference is negligible, in fact you might even prefer DaataScan's on-screen images, but there is a noticeable difference in the quality of the printed output; because the Power Scanner images are brighter, dot-matrix printers make a much better job of them than the DaataScan images, particularly when printed to a PostScript device or with the better

dither patterns produced by *TurboPrint Professional*.

AlfaScan Plus	●●●○○
DaataScan	●●●●○
Datel Handiscan	N/A
Handy Scanner	N/A
Power Scanner	●●●●●

EXTRAS

We've looked at the most important aspects of monochrome hand scanners, but there are many other features on offer.

The ability to 'clean up' a line art scan at the press of a button by automatically removing any isolated black or white pixels from the image is a great help. Otherwise you'll have to do it by hand, which is one of life's less interesting pastimes. Only two of the packages can do this, AlfaScan Plus and Power Scanner.

Another useful feature for line art scanning is the ability to lighten or embolden the image by adding or removing another line of pixels around the edges of the lines already there. Again, only AlfaScan Plus and Power Scanner do this.

One trick to get a picture that is wide but not very high into the computer is to scan it sideways and then rotate it by 90 degrees using the software. Only the Datel Handiscan software *cannot* do this. And only the AlfaScan Plus software will allow you to rotate images through any angle in 0.1 degree steps, not just in 90 degree jumps – with excellent results I must add, although it does take a long time. Power Computing tells me that an 'any angle' rotation facility will added to the 2.1 release of the PowerScan Professional software (although not the version 2 release). It'll have to be good to match the AlfaScan Plus.

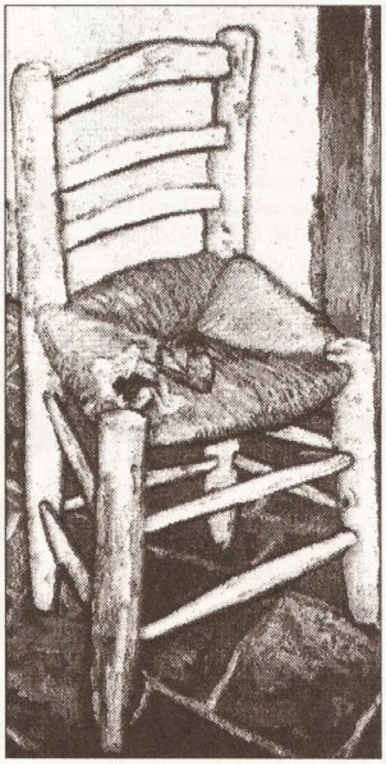
Along similar lines, flipping an image about its horizontal or vertical axis can be useful; again everything except Datel's Handiscan can do it.

Something the AlfaScan Plus software can do that none of the others dares to attempt is to slant or 'skew' images horizontally and vertically. It takes quite a long time to compute the changes, and the results may not always be what you expected, but the quality is good. (Power Computing says that PowerScan Professional 2.1 will include a skew feature. To be fair to the other packages, this version of PowerScan is still 'vapourware' and may or may not actually happen.)

Mixing scans on the same page as other scans can be fun, and all the packages except Datel's Handiscan allow you to scan to a 'clipboard' which is either first positioned on the page by dragging out a box for it, or by scanning it into a moveable brush-type object attached to the mouse pointer to be stamped down wherever you like.

The ability to resize the line art scans and halftone dithers might be important to you. All the packages can do this. Datel's Handiscan has a 'reduce by half in either direction' feature, and Power Scanner can also only reduce in 50% steps, but this software has separate facilities for reducing halftone dithers, which need special treatment because of the complicated patterns within them.

DaataScan and Handy Scanner have a marvellous resize feature to enlarge or reduce the image in the clipboard in percentages or pixels; you can click on arrows or type in specific numbers. Alas, the same routine is used for line art and halftones – reducing halftone dithers by removing every other pixel doesn't work, which is why there is a special facility for this in Power Scanner.



First impressions count – the 24-bit option with AlfaScan Plus means you get closer to the original masterpiece

RESIZING IMAGES

The AlfaScan Plus software is the most flexible of all for rescaling images. As in DTP packages, moving handles are arranged around the outside of the image. Alternatively you can create a clipboard box of specific dimensions and then import the image into it, either keeping its original aspect ratio or ignoring so that the image distorts to fill the box.

As useful as these re-sizing features may seem, do keep in mind that the results of reducing or enlarging a halftone dither in steps of anything other than 50% will produce strange patterns when the image is converted to grey because the original patterns in the 8 by 8 pixel grains produced by the scanner have been drastically altered. You are advised to convert to grey and re-scale the greyscale image within the DTP software you are using.



With an imagesetter, 24-bit images can make Vincent van Gogh look just like his old self

Line art is a different matter and the flexible resizing facilities within AlfaScan Plus, DaataScan and Handy Scanner enhance those packages.

SQUIGGLE ABILITY

Another feature related to scans of line art is the ability to add your own squiggles to them. For this you need facilities to draw lines and shapes, fills and fill patterns. Datel's Handiscan has no art tools, but then the images it saves are so small that they can be managed by an art package, and indeed it comes with an early version of *Photon Paint*, which isn't the best art program ever written, but it's better than nothing.

DaataScan and Handy Scanner only allow you to draw on images pixel by pixel in a zoom mode. To be fair this feature isn't supposed to be an art tool, it's there so you can 'clean up' the scan by hand removing isolated black and white pixels. So if you want to work on images saved from these packages you'll have to load them into an art package, and if they are massive 1,600 pixel wide images created on the 400 dpi setting you'll soon discover that there isn't an Amiga art package to cater for them. One or two might load them, but from then on you'll be walking a tightrope to the land of fireworks and frozen mouse pointers.

The Power Scanner software has a collection of standard art tools of which the best thing that can be said is that they are better than nothing at all – lines are always solid and one pixel thick, you cannot easily create curves, and there is currently no fill option (something to be added to 2), although you can paint freehand with a selection of fill patterns.

In the drawing department the AlfaScan Plus software, *Touch-Up*, is light years ahead of the competition. You can select from six different line styles, bezier and b-spline curves can be drawn, there's a user-configurable spray can, 36 fill patterns, four drawing modes (Replace, Transparent, XOR, and Replace and Transparent), any part of the image can be cut out as a brush of any shape and painted with... the list goes on; what *DPaint* is to coloured art, *Touch-Up* is to black-and-white.

Touch-Up is also streets ahead in file format support. The only format supported by all the others is IFF ILBM – *Touch-Up* can import those (of course), and also IMG, PCX, TIFF, *MacPaint* and *PrintMaster* files. It will export all those formats, plus Degas and GIF. Because of *Touch-Up*'s range of extra features, all the others pale in comparison, only Power Scanner is making an effort.

AlfaScan Plus	●●●●●
DaataScan	●●○○○
Datel Handiscan	●○○○○
Handy Scanner	●●○○○

AS

SHOPPING LIST

AlfaScan Plus........................ £195
by Alfa Data Computer Technic Corp, 3FL, No.8, Lane 263, Chung Yang Road, Nan Kang, Taipei, Taiwan, China
Distributed in the UK by
Golden Image (UK) Ltd, Unit 12a, Millmead Business Centre, Millmead Rd, London N17 9QU.
☎ 081-365 1102

Handiscan £129.95
by Datel Electronics Ltd, Govan Rd, Fenton Industrial Estate, Fenton Stoke-on-Trent ST4 2RS.
☎ 0782 744707

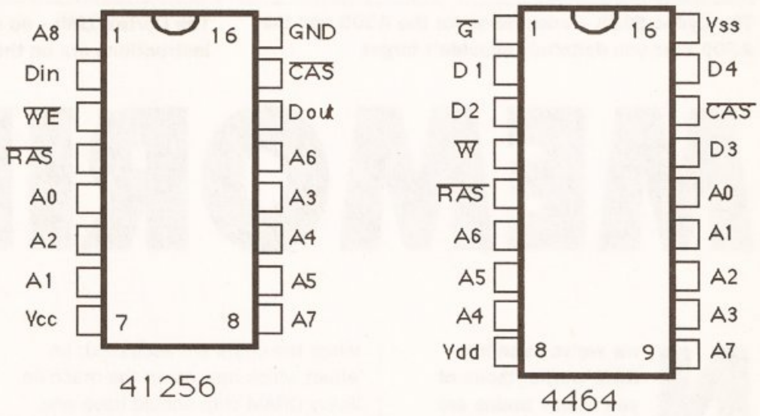
Handy Scanner..............£139.95
by Pandaal Marketing
Distributed in the UK by:
Zydec, P.O.Box 46, Evesham WR11 6TZ.
☎ 0386 45999

DaataScan....................£124.95
by Pandaal Marketing Ltd, 44 Singer Way, Kempston MK42 7AF.
☎ 0234 855666

Power Scanner £99.95
by Power Computing Ltd, Unit 8, Railton Rd, Woburn Road Industrial Estate, Kempston MK42 7PN.
☎ 0234 843388

MEMORY Total recall

Mark Smiddy answers more questions on RAM and compares fifteen of the best memory boards



Memory chips come in a variety of configurations. Both these devices are 256K bits. The 41256 is 256K x 1 Bit, the 4464 is organised as 64K x 4 bits

We're delving into memory again this month, with more on the intricacies of RAM. With all the knowledge you've acquired, we thought a guide to the best boards might also be useful.

Computers don't just work by addressing single bits – that would take too long. The exact number read or written at one time is determined by the width of the data bus. A system with an 8-bit data data bus will take four successive reads to read four bytes of information.

The 68000 has a 16-bit data bus; it reads the same data in half the time. The 68000's data registers are 32 bits wide, which gives rise to the expression 16/32. To fill a data register the 68000 must read memory twice, first collecting the lower 16 bits, then the upper 16. The 68020 and above have 32-bit data buses which can read longwords in one munch, if the actual memory expansion is also 32-bits wide.

Consider a 512K byte memory bank: there are 524288 separate 8-bit wide locations; on most Amigas these are organised as 262144, 16-bit words. If each RAM chip stores 1 bit, then each one will need 16384 separate address lines!

● IS THE ADDRESS BUS THAT COMPLEX?

No – in fact, the cells are organised on a square matrix. Any location can be reached by supplying a row and column address. To further reduce external lines, the row and column address lines are shared.

Take a look at the 41256 DRAM in the diagram top right. It has nine external address lines, numbered A0 to A8 – this gives 2^9 or 512, so the chip has 512 rows and 512 columns (RAM is always configured on a square matrix) giving 262144 (256K) cells in all.

The final calculation is arrived at by counting the number of data lines. The 41256 has two (one in, one out) which count as one. The 4464 has four. Multiplying the number of data lines by the number of possible addresses gives the device's size.

This still doesn't solve the problem that there are 256 or 512 possible rows and columns – this is handled by decoders on the chip.

● WHY'S THERE ONLY ONE SET OF ADDRESS LINES?

Each address requires two separate inputs and this is handled by discrete logic between the CPU and the RAM. The process of reading or writing a single byte of information goes like this:

1. Take CE LOW (make the chip appear on the bus.)
2. Pass the address to the decoding logic.
3. Decode a row address and load the address lines with it.
4. Take RAS LOW. The address lines are read and latched (memorised) internally.
5. Wait for the latch to take effect.
6. Decode a column address and load that on the address lines.
7. Take CAS LOW. The address lines are read and latched.
8. Wait for the decoding logic to take effect and then wait for address to validate then take DTACK to logic 0.
9. Read or write to the data bus.

In the Amiga, all this is taken care of by the Gary (gate array) chip.

● WHAT ADVANTAGE IS STATIC COLUMN RAM?

Static Column RAM or SCRAM can only be fitted to processors which support it, such as the 68020 and above. An awful lot of a processor's time is spent accessing sequential addresses – here there is no need to decode a separate Row and Column for every single address, since the data can be accessed by incrementing the Row. Hence the invention of static RAM, and the upgrading of processors to deal with it. On the 680x0 series SCRAM addressing is invoked by setting the BURST mode, speeding accesses by almost 50%.

● WHAT ARE THOSE ACCESS TIMES?

The access time of any RAM chip is the maximum time taken from a valid address appearing on the address bus to valid data appearing on the data bus. DRAM chips have a secondary memory cycle time – you can't read a bit, then read another bit straight away. A typical 120ns Hitachi DRAM requires a complete memory cycle of 220ns.

Such DRAMs are typically used in the Amiga A500 series. They can often cause problems for the designers of accelerator cards, since the RAM is too slow for the processor and wait states are generated.

● SO, WHAT ARE WAIT STATES THEN?

The system clock provides a continous square waveform (at a frequency of 7.14MHz on an A500). Every time the clock level changes a new state begins – so for every complete clock cycle there are two states. The CPU uses states to internally time certain events. Insofar as RAM is concerned, the 68000 allows four complete states for valid data to appear on the data bus. If the RAM does not respond within that time the 68000 halts external processing and generates "wait states". Every wait state lasts a complete clock cycle, so if Gary signals on an intermediate cycle, half a wait state is generated. This leads to some (mainly PC) systems described as "1.5 wait-state". In practice it never happens in the Amiga, apart from when there is heaving DMA or you add a bus-sharing accelerated processor like a 16MHz 68000 or an AT-Once Plus 16MHz 80286.

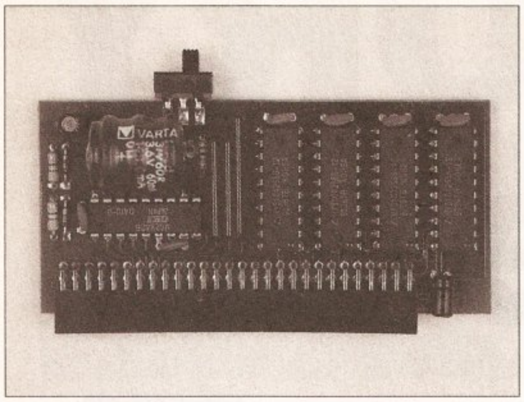
The total normal read/write cycle on the 68000 takes four clock cycles or 560nS. But the custom chips steal about half those (when accessing Chip RAM) leaving a total cycle time of 280nS. Since the DRAM responds in 220nS – well inside that, and wait states do not occur. Add lots of DMA contention (lots of colours on screen for instance) and the custom chips start to get cycle greedy and pinch extra cycles. This is why Chip RAM can be slightly slower than Fast RAM.

JARGON BUSTING • JARGON BUSTING

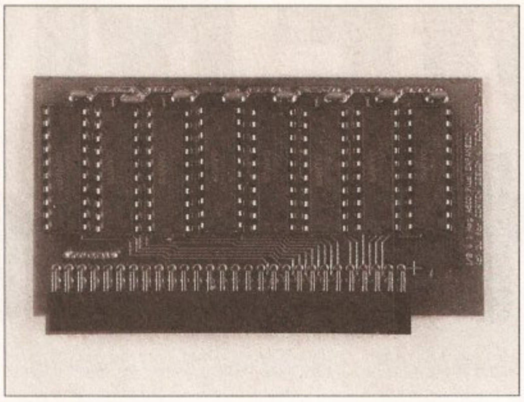
CE – Chip Enable – active low.

DTACK – Data Transfer Acknowledge – active low. Used by external devices (such as RAM) to signal the CPU it is ready to continue.

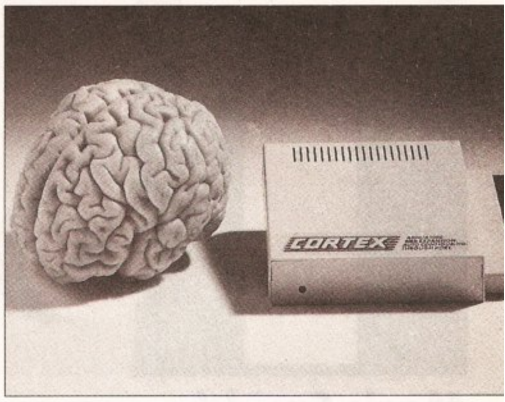
n – Prefix meaning the number should be multiplied by 10^{-9}. Therefore: 1nS = 1 thousand millionth of a second!



The Zydec 512K – one add-on for the A500 and the A500 Plus you definitely shouldn't forget



The Cortex 1Mb – so easy to install that the instructions are on the back of the box



With the Cortex 8Mb, you can run programs which are out of reach with a lesser equipped machine

MEMORIES ARE M

Now we've seen how RAM works, those of you whose brains are still waving the white flag can relax, because in true *Amiga Shopper* tradition, we're going to pick the best of the memory boards.

There isn't much to be said about individual systems; when it comes to the crunch RAM is RAM. No matter what people tell you, all RAM expansions run at the system's speed – generally, no one expansion will be faster than any other.

In the A500 512K category (by far the largest) there is very little to choose between the Zydec and Cortex boards with the Datel designs coming a very poor third. They lose points in two areas: the construction quality was below par and the designs skimped on those important decoupling capacitors. These devices stop the power supply "crow barring" when the chips are accessed; an effect which may crash the machine. *Every* DRAM chip should have one soldered as near its power lines as possible; the same goes for the 1Mb internal designs for the A500 Plus.

On the warranty busting 1.5Mb designs there is little to separate the Zydec units from the Power Computing design. Power and Datel share a similar compact Gary adapter, but the Datel loses out on poor construction and design.

SLOT EXPANSIONS

Only two externally fitted expansions managed to find their way here – one from American specialists, Supra and one from Cortex in the UK. Supra's little beasty features a bus pass-thru, offers up to 8Mb RAM and takes up next to no desktop real-estate. Sounds great – but there are two little snags. The expansion is achieved with rather rare 1Mbx4 ZIP

SEPARATE OR COMBINED?

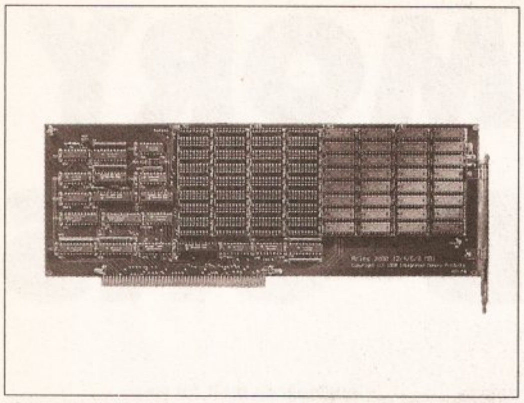
The question of external (Fast) RAM is an interesting one because you must pick the expansion carefully. For instance, although the Supra 500RX system works fine on most A500 machines, it stopped my A590 working. In the event it will usually work out cheaper in the long run to buy a combined RAM and hard disk expansion.

The A590 is a typical choice but that only offers 2Mb extra RAM and is always supplied with a hard disk. Roctec's RocHard, on the other hand can accept 8Mb of SIMM RAM and you can use it without a hard drive adding one at a later date. Notably some designs are restricted to the type of chips they will accept. SIMMs are cheaper and easier to fit than DIP cousins; but some designs require special ones. One culprit is the otherwise excellent GVP Impact Series II. It requires four expensive 2Mb SIMMs to take it to 8Mb. The original fitment of up to 4Mb of 1Mb SIMMs becomes useless unless you can find someone to take them off your hands.

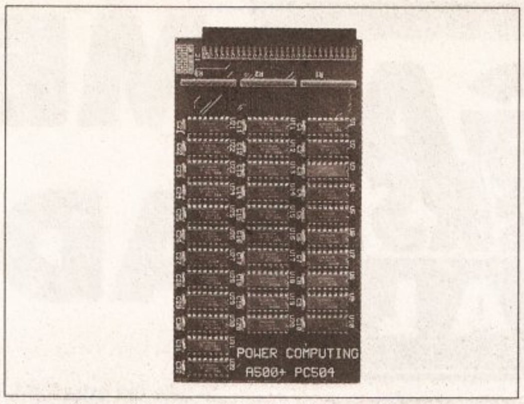
If 0.5Mb to 1Mb is your ticket the KCS Power PC board is a very expensive but worthy inclusion. It provides all the RAM of a standard expansion (1/2Mb or 1Mb) besides being the best PC emulator I have seen on anything micro.

•••• A COMPARISON OF THE MEMORY BOARDS ••••

Product	Zydec 0.5Mb	Zydec 1Mb	Zydec Megaboard	Zydec 1.5 Mb	Datel 512K	RAM Master 1.5Mb	Datel 1Mb
Construction	••••	•••	••••	••••	•••	•••	•••
	Clever little four-chip design and well made too	Nice board, marred slightly by thin soldering	Quality components but the jumper looks prone to failure	Two compact boards; nicely built too	Not the best around	Dubious board looks nice but lacks normal decoupling	SMT looks nice but lacks proper decoupling
Documentation	••	•••	•••	•••	••••	••••	••
	What did you expect?	Thin but quite adequate	Not much but you get what you pay for	One photocopied sheet ah, well...	Better than average	Above par for this type	Ummm...
Ease of fitting	••••	•••••	••	••	••	••	••••
	Simple, easy, a chimp could probably do it	Drop in and go	Open up and crowbar it in	You'll have to open the lid to get this in	Simple unless you want the Chip RAM option...	Not too bad Gary adapter is quite slim thanks to SMTs	A cinch!
Overall	••••	••••	••••	•••	•••	•••	•••
	Great stuff and good value too	Neat little expansion pity about the switch though	Great if you have a four-chip 512K board	Not for the beginner	Design looks a little suspect	Warranty basher, not for the beginner	OK for the money



The Aries 8Mb is a real star – the astrological sign which symbolises the RAM, the symbol of strength



Power Computing's 1.5Mb RAM expansion card – scores the top marks in its class

DE OF THIS...

• SUPPLIERS •

Product: **Supra 500RX/Aries RAM for A2000**
Supplier: WTS Electronic Ltd, Chaul End Lane, Luton, Beds ☎ 0582 491919

Product: **Cortex RAM expansions; GVP 8Mb for B2000**
Supplier: Cortex Design & Technology Ltd. Britannia Buildings, 46 Fenwick St, Liverpool L2 7NB ☎ 051-236 0480

Product: **AddUp RAM**
Supplier: Zye Technology ☎ 0293 538666

Product: **Zydec RAM**
Supplier: Evesham Micros, Unit 9, St. Richards Road, Evesham, Worcs. WR11 6XJ ☎ 0386 765500

Product: **Power 1.5Mb RAM**
Supplier: Power Computing Ltd. ☎ 0234 843388

• RAM ROUND-UP •

Size	A500	A500+	2/3000	Clock **	Total***	Price	Manufacturer
512K	Yes	Yes	No	Yes	1Mb	22.99	Zydec
1Mb	No	Yes	No	NA	2Mb	42.99	Zydec
1.5Mb *	Yes	No	No	Yes	2Mb	79.99	Zydec
1Mb *	Yes	No	No	No	2Mb	54.99	Zydec
512K	Yes	No	No	Yes	1Mb	29.99	Datel
1.5Mb*	Yes	No	No	Yes	2Mb	79.99	Datel
1.5Mb*	Yes	No	No	Yes	2Mb	79.00	Power
1Mb	No	Yes	No	NA	2Mb	79.99	Datel
512K	Yes	Yes	No	No	1Mb	19.95	Cortex
512K	Yes	Yes	No	Yes	1Mb	24.95	Cortex
1Mb	No	Yes	No	NA	2Mb	44.95	Cortex
8Mb	Yes	Yes	1000	NA	8.5Mb	369.00	Cortex
8Mb	Yes	Yes	No	NA	8.5Mb	380.00	Supra
8Mb	No	No	Yes	NA	9Mb	369.00	GVP
8Mb	No	No	Yes	NA	9Mb	269.00	Aries

* *Unit requires internal modifications to motherboard.*
** *Many units are also available without clock.*
*** *Assuming standard 512K or 1Mb fitted to machine and fully populated board.*

RAMs (if you want 2Mb or more). There's also an irritating switch to configure it for RAM test mode (software supplied). This disables the RAM, is easy to accidentally catch and intriguing for six-year old pinkies! Large expansions require additional power – a supply point is included but a suitable adapter isn't.

By contrast, the Cortex design is in a class of its own. Words almost fail me in describing just how beautiful this design really is. It is *big*, but gaze in awe at its construction. A steel box; 8Mb of SIMMs; compatible with the A1000 (remember those); comes with a power supply; proper thru-port. Big is beautiful: Cortex, can I keep this one please? AS

BEST BUYS • BEST BUYS • BEST BUYS

Zydec 512K for A500 and A500 Plus
Also available as AddUp RAM; narrowly beats Cortex

Cortex 1Mb for A500 Plus
Just pipped by the Zydec card, but they're both good

Cortex 8Mb A500/A500 Plus/A1000
What can I say? British is best after all!

Aries 8Mb A1500/B2000
The GVP looks better, but this is a clean, no fuss design.

Power Computing 1.5Mb
Not my personal taste, but best of its genre

Cortex 512K (no clock)	Cortex 512K	Cortex 1Mb	Cortex 8Mb	Supra 8Mb	Power 1.5Mb	Aries 8Mb	GVP 8Mb
••••	••••	••••	•••••	•••••	••••	••••	•••••
Reasonable and very compact four-chipper	Good old tough British design and construction	Looks built to last	Beautifully built and made to last for years	Very well built Pity about the ZIPS	Power's usual high-quality design and manufacture	Traditional build but it does what's required	Typical high-tech SMT design with custom goobers
•••	•••	•••	•••••	•••••	•••••	••••	•••••
Printed on the back of the box	Printed on the back of the box	Printed on the back of the box	More than you might expect	Quite a lot but mostly covers the utility disk	Typical quality from Power Computing	OK. Includes software and five-year warranty	Plenty of it...
••••	••••	••••			•••	••••	•••••
A doddle, just slips in the trapdoor	Drop it in and you're off	A two-minute job, anyone can do this	–	–	A little tricky, made easier by the manual	–	–
•••	•••	••••	•••••	•••••	••••	••••	
Makes a nice addition to the Zydec Megaboard	One of the best in the selection	Touch contender for the best in category	Not cheap but worth the money	A little expensive to expand if you start with 2Mb	Best value of this category	Less gimmicky than the GVP – that's all that's required	Quality kit

AMIGA ANSWERS SPECIAL

MEMORY ADD-ONS

Forgotten something important about memory? Can't get those synapses snapping into place? Our Amiga Answers Special RAMs the solutions home

DALI-ING CLOCK

Since fitting an A501 0.5Mb expansion, the clock on my Amiga has been erratic, seldom keeping time for more than a few days.

This is likely to be a simple case of a flat battery. Since the battery backed-up clock in your machine is supplied with a Nickel-Cadmium rechargeable, simply leave the machine switched on for 24 hours to give it time to charge up. After that, the clock should keep reasonable time in normal use. It will run down in two to three weeks if the machine is not switched on.

RAM CLASH

I bought a GVP hard disk with 2Mb of RAM fitted. Most of my programs ran OK, but when I tried to run *Pagestream 2, Protext 5, Photon Paint 2* or *Aegis Draw* from the hard disk they all crashed.

As soon as I removed the extra 2Mb from the hard disk the programs ran like a dream. Is the extra memory at fault, or is it a simple case of incompatibility?

There is no reason why programs such as *Pagestream 2* and *Protext 5* should crash with extra memory.

It certainly sounds like a memory problem. Firstly, check to make sure that both SIMMs are properly installed. They have to be very firmly pushed into place. If one SIMM is slightly misaligned it could cause the problems you are having. If this is not the problem, it looks like you have a faulty memory chip somewhere on your GVP board. This is sometimes difficult to diagnose with software RAM-testing utilities: some chips, for example, work fine until they warm up. The first thing to try is to leave the RAM test program running overnight. If that does not find any problem, your best bet is to send the 2Mb of chips back to your supplier and ask for them to be checked out on a professional chip-tester or, better still, ask them to give you 2Mb of new chips.

There is also a chance that your GVP card could have a fault on it, but get the chips replaced first. If that does not solve it, send the board back.

••• UPGRADING RAM •••

I own an Amiga A500 with two external drives and 1.5Mb Zydec RAM upgrade board. I am thinking of buying an A590 hard drive. Is it possible to upgrade the A590 to its 2Mb RAM facility and still use my existing 1.5Mb upgrade?

The 1.5Mb expansion fits inside the trap-door of the A500, whereas the A590 hard drive is designed to fit easily to one side, so there are no physical problems fitting the equipment. The two will work in harmony, including the extra 2Mb RAM upgrade. The cost of the 2Mb RAM is around £100.

EXPANSION FOR FREE?

While looking inside my Amiga 2000 I found a Commodore expansion board labelled 'A2000 1Mb RAM EXP. ASSY No 380 745 REV .3 a 101-042'. I noticed that there was room for 16 more chips. Does this mean I can have more memory without having to buy an 8-up board?

That particular board is rather old and only takes the machine up by an extra 0.5Mb using a set of 120ns 41256, or similar, RAM chips. However, before you rush off and buy those chips, there is more to this upgrade than meets the eye. Although the board can be configured to take the extra RAM, it has a design fault. Testers have reported, and Commodore confirms, that the machine becomes highly unstable when the extra RAM has been added and frequently crashes without warning. We cannot therefore recommend that you make the modification. A better bet would be to buy a later board, or one of the many third-party expansions.

POWERBOARD RAM

Can the Vortex AT-Once PC emulator access all 1Mb of my Amiga memory?

Yes, clicking on a few buttons means that the AT-Once installation software will enable you to decide how much of the memory you have fitted is available to the PC.

FAT AGNUS LOW-DOWN

I recently bought a Fat Agnus chip for my A500, which also has a Datel 512K RAM expansion. What do I need to do to get 1Mb of Chip RAM?

Getting your fatter Agnus chip to recognise 1Mb of Chip memory is possible on your machine, but the details vary depending on which revision motherboard you have. If you have a recent revision six motherboard, you will need to find JP2 on the motherboard (three small square solder pads), cut the connection between the bottom two, and solder a connection between the top two. Then, find JP7A (by the expansion RAM connector). Again, there are three solder pads; with the bottom two connected. Cut this connection. When you reboot your machine, you should have 1Mb of Chip memory.

If, on the other hand, you have a revision five motherboard, the procedure is a little more tricky. First, do the JP2 modification as described above for revision six boards. Now you need to cut a solder track. Please bear in mind that this is a difficult operation, and one which will void your warranty. We take no responsibility for any damage inflicted on your machine as a result of performing this operation, and we suggest that you get an authorised engineer to do it for you.

The track you need to cut is the one carrying the _EXRAM signal, connecting to pin 32 of the trapdoor expansion connector, on the underside of the motherboard. (You can find the pin numbering of the expansion by looking in Appendix F of your User Manual.) There is a hole about one eighth of an inch from pin 41, from which a track runs up the board. It is very close to a white line printed on the board – this white line hides another track beneath it, and must not be cut. The track coming from the hole is the one to cut.

DOTTY SCREEN

My Amiga's screen flashes every time I hit a key, and pixels appear at random on it. The disk prompt after a reset is greatly corrupted. When I try to reboot, the drive either continually spins or just spins a bit and then stops.

This weird effect of random dots appearing all over the screen is simple to diagnose in general, but it is not always easy to track down the specific cause. The problem is simple: either the RAM chips are faulty or they are not being refreshed. DRAMs used in many computers need to be refreshed every couple of micro-seconds so the data they contain is not lost. When bits drop out because something has gone wrong, the result tends to manifest itself as random crashes and/or bits of garbage appearing like holes all over the screen.

First remove any RAM expansions you may have and see if that cures the problem. For instance, a faulty A501 clone could give rise to this type of fault. Failing that, get the machine checked over by an approved Commodore repair.

PC RAM IN AN AMIGA

I recently purchased, for a bargain price, a 4Mb memory expansion for a Compaq computer. Obviously this is not suitable for the Amiga, but I was hoping I could transfer the chips to an Amiga expansion board.

The board is populated with these chips: TC511000AP-10. If

continued on page 26

POWER COMPUTING

GVP Series 2 HD (A500)



Jp to 8MB Fast RAM on board

52QMB 0MB	**£369**	105QMB 0MB	**£479**
52QMB 2MB	**£419**	105QMB 2MB	**£529**
52QMB 4MB	**£469**	105QMB 4MB	**£579**
52QMB 8MB	**£599**	105QMB 8MB	**£719**

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0MHz 68030EC accelerator
Optional 68882 maths co-processor
Jp to 8MB 32-bit Fast RAM on board
8882 Upgrade kit **£239**
2MB 0MB **£729** 105MB 0MB **£869** 240MB 0MB **£1069**

GVP Series 2 HD

Jp to 8MB Simm RAM on board
upports external SCSI devices
or A1500/A2000
Bare **£199**

2QMB 0MB	**£279**	105QMB 0MB	**£479**
2QMB 2MB	**£339**	105QMB 2MB	**£539**
2QMB 4MB	**£399**	105QMB 4MB	**£599**
2QMB 8MB	**£469**	105QMB 8MB	**£749**

GVP G-Force

8030 Accelerator board
8882 Maths co-processor
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igh quality 8-bit sampler
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Vorks on any Amiga **£55**

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Up to 128MB on each removable cartridge
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Compatible with Amiga, PC, Mac. A SCSI controller is required on the Amiga and PC

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25MHz Motorola 68040
Built-in maths co-processor
Expandable up to 32MB of RAM
Software compatible with 68000 processors
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Up to 8MB RAM on board
For A1500/2000
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52QMB 0MB	**£279**	105QMB 0MB	**£479**
52QMB 2MB	**£339**	105QMB 2MB	**£539**
52QMB 4MB	**£399**	105QMB 4MB	**£599**
52QMB 8MB	**£469**	105QMB 8MB	**£749**

Kickstart ROM Switch



The Power Kickstart ROM Switch fits into any A500 or A500+ and can be fitted with up to three Kickstart ROM's and can be enabled when you switch on your Amiga.
This gives you all the benefits of the new versions of Kickstart while still being able to use your old games and software.
Kickstart ROM switch (Bare) **£17.95**
Kickstart ROM switch with 2.04 **£59.95**

Chips

256K x 4DRAM **£4.50** 4MB x 8Simm **£150**
1MB x 1DRAM **£3.95** 1MB x 8Simm **£30**
8372 Fatter Agnus **£39** 1 x 4 Zip **£19.95**
A3000 Static column RAM **£22**
Simm 32 x 1MB-60 **£65** (suitable for GVP A530)
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Tel 215 922 0050 Fax 215 922 0116

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these chips can be utilised, could you please recommend a suitable expansion board?

The chips on the board are 1Mb x 1 100ns chips. In theory these can be used; most Amiga 2000 cards use 1Mb x 1 chips. However, there are a few problems. First, recent Compaq memory cards use surface mounted memory chips. These look like small square blocks with pins on each side, soldered directly to the circuit board. These are not removable and can't be used with the Amiga. If the chips are socketed they are likely to be one of two types: DIP type are standard chip-shape with a row of pins along each side; ZIP are newer chips which stand side-on with all the pins along one edge.

The only board I know of for the Amiga 500 that will take 1Mb x 1 DIP chips is the Spirit X-RAM expansion, although I don't know of anyone who is still supplying this.

As for ZIP chips, I haven't found anything that will use 1Mb x 1 ZIPs. All the expansions for the Amiga using ZIP chips take the 256 x 4 ZIP instead.

WHO IS AGNUS?

What is the significance of the Agnus chip, and why are some fat? Also, what is the difference between Fast and Chip RAM?

The Amiga has a Motorola 68000 16/32-bit processor – the chip which has control over the rest of the computer, the 'brain'. It has an address space of 16Mb; the Amiga is set up in such a way that 9Mb of this is available for random access memory (RAM).

Not all of this addressable memory is the same; the difference stems from the fact that part of the RAM address space is shared by both the 68000 processor and the Amiga's three custom chips. It is this shared memory that is known as 'Chip' memory.

The three custom chips (called Agnus, Paula and Denise) handle a number of specific tasks involving graphics, general screen display operations, sound and so on. (The blitter, the device which can move pixel data around the screen at speeds approaching one million pixels per second, is part of the Agnus chip.) The amount of memory that these original custom chips could share was limited to that definable within a 19-bit address space. This meant that no matter how much memory was available in the machine, the custom chips could only access the lower 512K. Since Amiga graphics and animation programs have grown in size and power, the 512K limitation has become noticeably restrictive.

Several years ago, Commodore began working on an enhanced chip set (ECS) and this included a replacement for Agnus called 'Fat Agnus'. This new version, so called because of its physical shape, effectively does the same job as the original chip, but reduces the support component chip count – all clock generation for the Amiga system, for instance, is now incorporated into Fat Agnus, as are the control signals for handling Chip RAM access.

The big difference as far as Chip memory goes, though, is that Fat Agnus now has address lines which can access twice as much memory. Hence a machine fitted with Fat Agnus has 1Mb of shared address space and so can have 1Mb of Chip memory fitted.

Fast RAM is so-called because processor accesses to it are quicker than to Chip RAM. This is because the Amiga's bus contention scheme is such that the main 68000 processor can sometimes get locked out of the Chip memory address space because of something known as cycle-stealing. One graphics-intensive situation in which this can occur is during Direct Memory Access-oriented high-speed blitter operations. A program running in Chip memory could therefore be slowed down at these times. Some clever hardware tricks, however, allow the 68000 processor, even while locked out of Chip memory space, to still access memory outside this region. This non-Chip memory region, or Fast memory, is therefore an ideal place for putting your executable programs. For maximum speed you would ideally want to have a reasonable amount of Fast memory also available – programs running in fast memory would then not be slowed down by any custom Chip cycle-stealing operations.

JARGON BUSTING • JARGON BUSTING • JARGON BUSTING

Agnus chip – The custom chip dedicated to graphics. The first three versions – 8361, and the 8370 and 8371 Fat Agnus – can access 0.5Mb of Chip RAM. A later version, 8372a, can access 1Mb; while the ones used in A500 Pluses and A3000s can access 2Mb.

Blitter – Part of the Agnus chip which can move and alter areas of memory (specifically graphics memory) at high speed, without intervention from the central processor. As a result, it is used extensively for animation.

Chip RAM – The area of the Amiga's memory directly accessible by the custom chips, originally a maximum of 512K. Newer machines with the fatter Agnus graphics chip can access 1Mb, enabling smoother animations and more screens to be displayed at once. The new A500 Plus comes with an Agnus chip capable of addressing 2Mb of Chip RAM.

EMS – Expanded Memory System, or LIM (Lotus Intel Microsoft) EMS – a system enabling an application to use more than the normal MS-DOS limitation of 640K of RAM.

Fast RAM – Extra memory which is not Chip RAM. The custom chips cannot access it, and since such accesses to Chip RAM can block out the central processor and slow down its own accesses, Fast RAM is faster.

WHO IS GARY?

I recently upgraded my A500 to 1Mb. However, I soon realised that I really need even more memory. I saw an advertisement for the Megaboard from Evesham Micros which fits in between the 512K upgrade and the Amiga to give a total of 2Mb. The documentation states that installation requires connection to the Gary chip.

Exactly what is the Gary chip, what does it do, why must the Megaboard be connected to it and how does the Megaboard connect to it?

The Gary chip in the Amiga 500 controls the memory and the memory expansion. When the Amiga 500 was designed it was thought that 1Mb of memory would be enough for most people. The expansion slot was therefore only designed to accept 512K of extra memory. Some companies have found that by connecting a few extra wires between their boards and the Gary chip they can get a lot more memory in the slot, particularly as modern expansions use less chips and are therefore smaller. To fit the Gary extender you will have to open up your Amiga 500 (this will invalidate your guarantee), remove the metal shielding and carefully remove the Gary chip – which can be done with two flat-bladed screwdrivers. You insert the chip into the connector, and plug that connector back into the motherboard. It's a very simple job; if you can wire a plug you can put the Gary adaptor in.

CHEERLESS CHIP RAM

My computer (Amiga 1500) has no Fast memory which seems to affect some programs which use this, particularly public domain demos (*Zero Defects*, *TAS Ego Trip* and so on). Is there a cheap and simple add-on solution, or am I doing something wrong when loading?

The problem is due to sloppy programming. With a 1Mb Chip RAM system, memory areas are not in the same place as in machines with Fast RAM, so some programs (particularly demos) object strongly. Adding some Fast memory into your system will allow these system areas to move so more (although by no means all) of these programs will work.

MEMORY SWITCHING

I have an old A501 memory expansion unit, and I wish to add a disable/enable switch to it. Please could you tell me the pin(s) to connect to and/or the pinout values of the unit.

The pin-out information for the A501 connector is shown in the back of the Amiga 500 manual. To disable the A501, cut the EXRAM line on the board (and solder a switch across it so you can enable it again!).

Firstly, rip off the metal shielding from your A501 board. You don't actually need this; it's purely to prevent the A501 giving out RF emissions (which is strictly controlled in the States). Looking at the bottom of the A501 board, there are two

●●● DISAPPEARING MEMORY ●●●

Before double clicking on a program's icon I record the available memory in the Workbench title bar. If I double click and start the program several times rapidly one after another, and then wait for them to terminate, there is always an overall memory loss. I'd like to know where the memory goes. Is it caused by a bug in the operating system? I am aware that after the first execution the free memory may be reduced due to libraries being loaded.

Anything which is happening will be due to a flaw in the memory allocation and deallocation routines of the program concerned and not to bugs in the Amiga's operating system. The program asks the system for some memory, but does not free it after use. Exec therefore cannot reallocate it afterwards.

long rows of solder lumps which are the legs of the connector that fits into the A500. Look at the row nearest the edge of the board. Holding the board so this row is at the top (and the chips are facing away from you) counting thirteen pins along from the left, you should see a small track leading from that leg to a larger strip on the board. Cut that small track and solder two wires, one to that pin and one to the second pin from the left (this is the pin that the larger track is connected to).

Solder the other two wires to a small single pole single throw switch and you can switch the A501 on and off (but the clock will always work, which can be handy).

ELUSIVE RAM

I have an A500 with a 1.5Mb upgrade board. When using the normal Fastmem option, everything is fine. Programs tell me that I have 0.5Mb Chip RAM and 1.5Mb of Fast RAM. However, when I switch to the Chipmem option, the programs say that I have 1Mb Chip RAM and no Fast RAM. Where did my other 1Mb of Fast RAM go?

The 1.5Mb expansion boards available from many suppliers aren't that well designed. They are designed to have the whole of the expansion memory in one block, starting at a certain address in memory. When you choose the Chipmem option it relocates the entire block of memory much lower down to the Chip memory area. Unfortunately, this means that although the first 512K is at the right memory address for Chip RAM, the remaining 1Mb is no longer in the Fast memory area. If it was enabled the Amiga would think you had 2Mb of Chip RAM (although you would only have 1Mb), so it would try to use the second megabyte as Chip memory and crash. Rather than design a clever board that would keep the vanishing megabyte at a safe address whichever mode you are in, some manufacturers chose the simple way out and just disabled the extra memory.

CHIP RAM PIPPED

I tried to make the modification to have 1Mb of Chip RAM on my Amiga 500 with A501 RAM expansion, but it didn't work. When I connected the computer to the mains the power light started blinking (like when a Guru occurs). However, when I put it back to normal everything worked fine. What could have happened? Isn't the A501 compatible with this change?

I noticed some (four) unused places for ICs between the RAM chips. I suppose they could be used to increase the computer's memory on board to 1Mb of Chip. If that is possible could you please explain to me how?

The early A501 used slow 120ns and 150ns chips; some of these cards are too slow to be used as Chip memory with the faster 80ns or less chips in the recent A500s. Buying a new cheaper A501 clone should solve your problem (as long as it is one of the four-chip boards)

You can add extra chips inside the A500 to give 1Mb of Chip RAM, but you can't use this at the same time as an A501 card fitted.

Do the same changes to the board as for the 1Mb Chip RAM modifications and solder four chip holders into the space for the sockets. Solder a decoupling capacitor for each chip (0.1uF should do) in the space below the chip. You will need four 256x4 80ns CMOS DRAMs to place in the sockets.

If you want a clock as well, disable the memory on your A501 (by cutting the EXRAM line as described elsewhere, and you will purely have a clock card.

••• EXPANSION BOTTLE-NECK •••

I am considering purchasing a RAM expansion for my A500 to take it past the 1Mb limit. I have been told that if I purchase certain RAM expansions using SIMMs, then when I wish to expand beyond the initial 4Mb to 6Mb or 8Mb, I have to throw away the existing chips and replace them with another type. Is this true?

Yes. Existing RAM in many cases will have to be removed in order to accommodate the increased capacity of the new chips. All is not as forlorn as it sounds, in many cases you can negotiate a trade-back price on your old chips. You won't get the full price back and you will have to negotiate. It is perfectly possible for the supplier to use these chips again in another 4Mb unit, therefore there is no reason why they cannot be credited to you on your next purchase.

SOUND QUESTIONS

I currently use *MasterSound* for making jingles for a local hospital's radio service. If I buy an 8Mb RAM expansion, will I have extra sampling time? I have heard that samples are stored in Chip RAM, so can I sample into Fast RAM?

You're right in saying that sound samples must be stored in Chip RAM for the Amiga sound hardware to access them, but most modern Amiga samplers get around this limitation by using the 68000 to copy the sample data held in Fast RAM to Chip RAM as it is needed. *MasterSound* too will enable you to grab samples limited in size only by the size of your RAM expansion, so you already own a sampler that is up the job.

CLOCKING ON

Is there any way I can alter the startup-sequence on my Workbench disk so that the time from my battery backed-up clock is displayed at the top of my screen while Workbench is running?

Enter the following command into your startup-sequence between the Path and the LoadWB commands (remembering to use a copy of your Workbench disk):

```
run <nil: >nil: clock ↵
digital2
```

This can be done with a text editor such as Ed.

REMEMBER THE PC

I understand that the KCS PC emulator comes with 1.5Mb of memory in total, with 1Mb for the Amiga and around 704Kb in PC mode.

If I buy the Cortex 8Mb expansion, does it mean I also get more memory available in PC mode?

The KCS Powerboard is limited by MS-DOS which can only access 640K. However, drivers are included for LIM EMS (Lotus-Intel-Microsoft Extended Memory System) and these enable some programs to access the extra memory. This only applies to external, auto-configuring cards fixed to the Amiga 500's expansion port.

HUGE RAMIFICIATIONS

How can I expand the memory of my Amiga 500 to around 2.5 to 3Mb so that I can run *Pagesetter*, my art and word processing packages all at the same time?

One option is the Cortex Expansion from Memory Expansion Systems (☎ 051 236 0480). Prices start at £199 for 2Mb of RAM. The expansion plugs into the Amiga's side expansion slot, but duplicates this slot so that other things such as hard disks can be plugged in afterwards.

If you are going to be doing a serious amount of work on your Amiga, it might be worth buying a hard disk drive. Most of these can have RAM put inside them.

RAM RETRACTION

I have an Amiga 500 with Kickstart 1.3 and a fatter Agnus, and have been using *Deluxe Paint IV*. It's a very memory hungry program, so I bought a 2.5Mb upgrade, configured to 1Mb Chip RAM and 1.5Mb Fast RAM.

Now, whenever I use *Deluxe Paint IV* in hi-res mode every other page is corrupt, and often the computer Gurus. Would upgrading to Workbench 2 solve my problems?

Your board is faulty. Commodore does not recommend using any memory board that fits in the trapdoor expansion and carries more than 512Kb of RAM. This is because some are unreliable and some simply do not work on certain Amiga configurations. Unfortunately, you have found one of those. Workbench 2 will make no difference.

JARGON BUSTING • JARGON BUSTING • JARGON BUSTING

Guru – A message from the Amiga system saying that a fatal error has occurred. The message appears in a large, flashing red box and includes two numbers which are of use to programmers trying to ascertain why their programs have failed.

Hard drive – Like a floppy drive, but much bigger and faster. Also, the disk cannot be removed, so once the hard drive has been filled, it's either time to delete excess files or get another one.

PC emulator – A software or hardware addition to the Amiga which will enable it to run programs written for the IBM PC. This is useful because there is a greater range of business programs available for that machine.

RAM – Random Access Memory, so called because any part of it can be accessed immediately, rather than having to search through from the start of memory to the point of interest. RAM is used to hold programs while they are being executed and temporary data. The contents of RAM are lost when the power is switched off.

SIMM – Single Inline Memory Module, a collection of RAM chips in a package.

Creating the frames for an animation is only half the battle – you also need to add sound effects and music. Jason Holborn explains how it's done and selects the best package to do the job

Sound in motion

Drawing frames for an animation is the most important aspect of the animator's trade, but the process of creating a good animation doesn't stop once all your frames are complete. To create a truly life-like computer movie which will keep people interested, you need to stimulate more than just the visual senses by adding sound effects and possibly even a little atmospheric music here and there.

Sound is one area where many would-be animators go wrong. Beautiful frames may not be enough to keep your audience captivated. Imagine watching your favourite television program – if you were to turn the volume right down you'd soon get bored. After all, it's the dialogue, sound effects and music which keep you interested. Radio plays such as the *Archers* work very well for this very reason, but when was the last time you watched a silent movie from start to finish?

Thanks to its complex sound architecture, the Amiga's ability to record and play back sampled sounds makes it an ideal medium for creating animations which stimulate both the audio and visual senses. Virtually all Amiga animations feature sound effects. These range from 'spot' effects like a door closing to complete dialogues. The good news is that you can create all this and more on your Amiga.

SAMPLE THIS!

It's always worth checking that an animation package will allow you to add sound effects before you hand over your hard earned cash. We'll be taking a look at the range of Amiga animation packages on pages 30 and 31, but in the meantime let's continue with a look at what extra equipment and software you'll need to get started.

The soundtrack for an animation will comprise of basically two elements – music and sound effects. You'll therefore need a package (or more likely two) which will enable you to create these elements. In the case of music, you'll need a sound chip composition package such as Electronic Arts' *Deluxe Music*. Before you splash out though, check to make sure that the music package which you have your eye on can output files in a format which is compatible with your animation package. Most will support IFF SMUS format at least, so this is always a safe bet.

For sound effects, you'll need a sound sampler (a device which allows you to 'grab' sounds from the real world and play them back on your Amiga). Another useful addition to any sampling setup is a microphone which will come in handy for grabbing sounds for animations because you will be able to record any real-world sound directly without having to source a pre-recording. For sound effects, file formats aren't a problem as all samplers use the same IFF 8SVX format.



A worthwhile investment for any would-be animator is *AudioMaster* which can be used to grab digitised sound effects from the real world

FRAME GAME

The process of adding sound effects and music to your animation depends entirely upon the package that you're using. If you've created your animation in a program like *Deluxe Paint 3* or *4*, then it's not actually possible to add sound effects directly. Instead, what you must do is load your animation into an animation sequencer, a program which enables you to tie in sound effects with an animation at frame accuracy. Several are available within the PD libraries, although none are particularly special.

A much better bet is to buy yourself a dedicated animation package such as the *Disney Animation Studio*. It is particularly good at creating animations with sound effects thanks to its powerful Exposure Sheet facility. Another very good package for sound support is Gold Disk's *MovieSetter*, although both use very different methods of incorporating sound effects.

All this aside, both *MovieSetter* and the *Disney Animation Studio* enable you to assign a sound effect to a particular frame. Let's say, for example, you wanted the Amiga to generate the sound of a gun being fired at the exact moment that an on-screen character pulls the trigger on his revolver. Within both packages, all you would have to do is to find the frame which first shows the trigger being pulled and then assign the sampled gunshot sound to this frame. Then, when the animation is played back, the sound of a gunshot will be played at the exact moment the trigger is pulled.

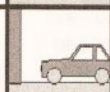
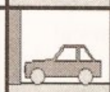
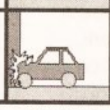
BLOOD THIRSTY

The Amiga's polyphonic sound output can also be used to play several sound effects at once. Take for example a car being driven into a wall. Basically you'd need four separate sounds for this animation – the sound of the engine, the screeching tyres as the driver tries to avoid the oncoming wall, a sickening crash as the car strikes the wall and finally an explosion as the car's fuel tank ignites (we're a blood thirsty lot on *Amiga Shopper*!).

The animation starts with the sound of the car's engine as the car enters the frame from the right. As soon as the driver sees the oncoming wall, he slams on his brakes causing the wheels to lock up producing the sound of screeching tyres. At this point, the engine noise and the screeching tyres sample will be played as looped samples at once, although both are quickly replaced by a crash as the car strikes the wall. In turn, this sample is replaced by the final explosion which spells the end for our animated jallopy.

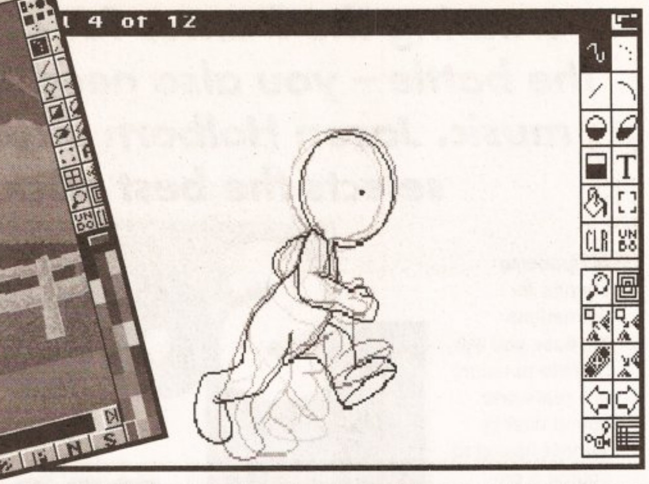
Creating an animation requires more than just artistic ability and audio skills. Indeed, a good animator is someone who can not only draw good looking frames and add nice sound effects, but can also merge these two elements together to form a seamless whole whilst still managing to make the animation interesting. Sounds like a lot of work? You'd better believe it! At the end of the day, a good animator is someone who can be an artist, musician, sound engineer and director all rolled into one.

ANIMATION:
ADDING SOUND EFFECTS

FRAME	ACTION	SOUND EFFECT
1		Looped Sample of car engine
2		Looped Sample of car engine Sample of screeching tyres
3		Looped Sample of car engine Sample of screeching tyres
4		Sample of screeching tyres Crash! sample
5		Explosion sample

As you can see, it's perfectly possible to assign several sound effects to a single frame





Far left: with the recent release of *Deluxe Paint 4*, Electronic Arts' industry standard paint package has also become an industry standard animation package

Left: *Disney Animation Studio* is a great program for beginners and experienced users alike thanks to its use of traditional animation techniques

CHOOSING THE RIGHT PACKAGE

Animation packages come in all types, but by far the most common is the traditional 2D page flipper variety. These work in basically the same way as the mini-animations you may have drawn on the edge of your text books at school. Although the technology itself may have changed, the theory is still pretty much the same.

Of course computers can take a lot of this work away from you – in the case of packages such as *Fantavision* and *DPaint*, the Amiga can draw frames for you. All you have to do is to show it what the first and last frames look like and the Amiga will generate a number of frames in between (hence the name tweening) which perform a transformation between the first and last frames.

DELUXE PAINT 4

£89 Electronic Arts ☎ 0753 49442

You may not immediately associate *Deluxe Paint* with animation work, but it's been a capable animation tool ever since Electronic Arts built animation support into *DPaint 3*. Back then it was pretty advanced stuff, but creating animations from scratch was no easy task – touching up existing animations was about as far as things went.

With the release of *Deluxe Paint 4*, Electronic Arts has managed to produce what must rate as one of the leading Amiga animation packages. Many of the problems which dogged its predecessor have now been addressed, making *DPaint* a very capable animation system. When you combine this with its painting power, *DPaint 4* has probably done more to encourage Amiga owners to try their hand at animation than any other package.

Animations can be created in two ways with *DPaint* using its lightbox facility (a slightly slower adaptation of the *Disney* onion skin system) or through its automated frame generation tools. These range from the simple 'Move' requester which enables you to move brushes around the screen in three dimensions, to its new 'Brush Metamorphosis' facility which transforms one brush to another creating an animation.

No-one could possibly doubt that *DPaint* is a fine package for creating animations, but it is let down in several areas. For starters, it doesn't support sound within its animations, so a separate animation sequencer will be needed to take your animations any further. Secondly, frame control is a little weak – some form of exposure sheet would have helped things considerably. Finally, once a frame has been rendered, it cannot be altered without a considerable amount of redrawing.

On the whole though, *DPaint 4* is still one of those packages which every Amiga animator should own. It's by no means the final word in Amiga animation – after all, *DPaint* is still primarily a paint package rather than an animation package. What it does do though, it does very well.

DISNEY ANIMATION STUDIO

£79 Silica Systems
☎ 081 309 1111

For beginners, one of the finest animation programs available is the *Disney Animation Studio*, a package based on the working practices of the traditional Disney animator. Developed in conjunction with Disney in the States, the package comes with a selection of animated Disney characters which illustrate the art of the cartoon animator.

As with a traditional animation studio, there are four stages involved in developing an animation from inspiration to the final full colour animation complete with sound effects. The *Animation Studio* splits these four stages into three programs. The first is called the Line Test module which is basically a 2-colour paint package which steals more than a few tricks from *Deluxe Paint*. What makes this package so special though is its special 'Onion Skin' feature which enables you to 'see through' the frame which you are drawing with previous frames shown in lighter shades of grey.

The animation can then be loaded into the Exposure sheet module for editing. Like a real Exposure Sheet, *Disney*'s XSheet enables you to organise your animation's frames in any order you like and to control the timing of each. You decide which frames are to be shown, when and for how long. The Exposure sheet module also enables you to tie in IFF sound effects with individual frames and load and play a sound track in IFF SMUS format.

The final stage is the Ink&Paint module which enables you to add colour to your black and white animations. A variety of colour screen formats are supported including both 32-colour and even EHB modes. This is perhaps the most time consuming part of the whole process because each frame must be individually painted by hand.

WHAT THE ANIMATION PACKAGES HAVE ON OFFER

Program	Memory Requirements	Frame Control	Sound Support	Built-in Image editor	ANIM files	Onion Skin	Tweening
DPaint 3	1 Mb	No	No	Yes	Yes	No	Yes
DPaint 4	1 Mb	No	No	Yes	Yes	Yes	Yes
Disney Anim St	1 Mb	Yes	Yes	Yes	Yes	Yes	No
Take-2	1 Mb	Yes	Yes	No	No	No	No
Fantavision	512k	No	Yes	Yes	No	No	Yes

MOVIE SETTER

£50 Gold Disk/Silica Systems
☎ 081 309 1111

Badged as the first WYSIWYG (What You See Is What You Get) animation program for the Amiga, Gold Disk's *MovieSetter* is an almost completely mouse-driven animation system enabling you to combine digitised sound, scrolling backgrounds and IFF brushes to create long animations on even the most memory-starved Amiga. One nice feature is the way in which it handles animation elements – even if you add a character and move it through several frames, it does not become a permanent part of the animation. As a result, animated objects can be altered and even removed from a series of frames without you having to redraw the entire animation from scratch.

MovieSetter animations consist of two basic elements – pictures and 'faces'. Backgrounds (which are just standard IFF ILBMS images) can be in any format including overscan, giving you the ability to create animations suitable for video work. A 'face' is an IFF brush which can be moved across the background. By grouping faces into a 'set': these brushes can be animated.

Individual faces and sets of faces are created using the Set Editor. Although the program doesn't directly support IFF ANIM Brushes like those produced by *DPaint*, *MovieSetter*'s face sets are very similar. By assigning several faces into a set, all you need to do to create a series of frames is to enter the 'Scene Editor' and click where the first face is to appear, click again for the second and so on. Once you've finished, *MovieSetter* renders these into individual frames, creating the illusion of movement.

Each 'character' in your animation is given its own 'track' – a little like the tracks used within music software. Several tracks can run concurrently with each, controlling the movement of a single object. Another important element is the 'Event' which initiates a particular action. Several events are on offer – sound events (these play a given sample when a particular frame is played), a background event (changes the background image), a palette event (changes the screen's colour palette) etc.

MovieSetter may be starting to show its age a bit, but it's still an impressive package. Whilst it is initially rather confusing, it doesn't take long to get used to its often quirky user interface. As for the results obtainable, just check out any Eric Schwartz animation. All of Eric's work is created using *MovieSetter* – and there's no better recommendation than that!

TAKE 2

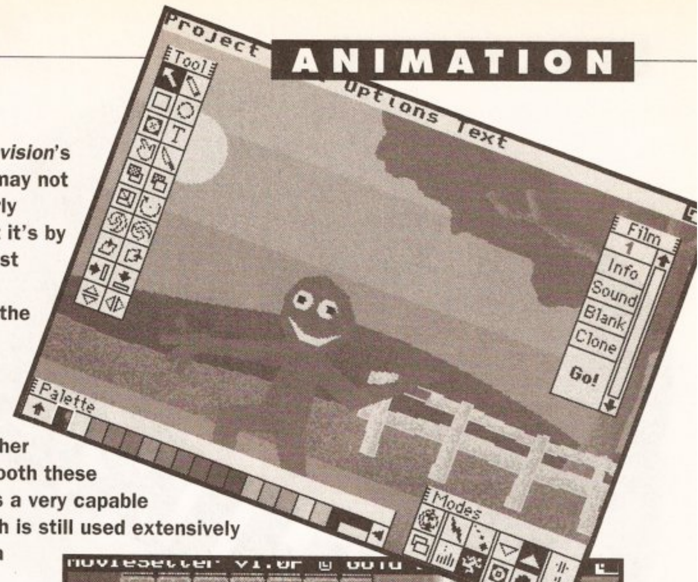
£95 Rombo Productions
☎ 0506 466601

One of the newest animation packages to be released is Rombo's *Take 2*, an animation sequencer that has been designed to integrate with Rombo's impressive Vidi-Amiga video digitiser. Available separately or as a package consisting of video digitiser, RGB splitter and software, *Take 2* was designed and programmed by Geert Vergauwe, a professional animator who works in the animation department at the Royal Academy of Fine Arts in Ghent.

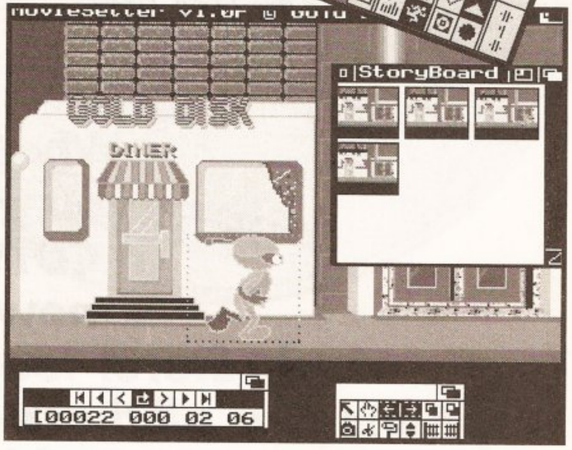
Just like a professional animation system, *Take 2* is tied in closely to an Exposure Sheet which allows you to control the flow of an animation and add sound effects to frames. Branching off from this is the Flipper Page which looks and operates in a similar fashion to a video recorder. Just like a VCR, there are buttons to start and stop, flick backwards and forwards plus extra buttons to control the playback speed and toggle the Amiga's four sound channels on and off.

An animation can be built up in a number of ways with *Take 2*. If you have access to Vidi-Amiga and a mono video camera, you can digitise a series of frames from within *Take 2* and pull these into your animation. The amount of control that *Take 2* gives you over Vidi-Amiga is pretty impressive – you can alter the format of the frames that it grabs and grab either just a single frame or a whole series of frames limited only by the RAM inside your machine. If you don't have a digitiser, individual frames drawn within a conventional IFF paint package can be pulled in.

As with *MovieSetter*, you're given a considerable amount of control over the elements which inhabit your animation. By assigning a particular element to one of four 'layers', you can alter your animation at any time, regardless of how many frames you've created. This sort of flexibility is important when creating animations and it's one feature that sets a program like *Take 2* apart



Right: *Fantavision*'s animations may not be particularly detailed, but it's by far the easiest animation package for the Amiga



Below: *MovieSetter* may look rather long in the tooth these days, but it's a very capable system which is still used extensively by top Amiga animators

from pseudo animation programs like *DPaint*.

Finally, you can attach sound effects to any frame using the exposure sheet. Up to four sounds can be played at once, although the total number which you can use in your animation is limited by your Amiga's memory.

Take 2 is not the kind of system to create animations from scratch. Unless you're lucky enough to own Vidi-Amiga (a recommended purchase for all animators!), you're going to need a paint package and a sound sampler at least. Its inability to save animations in IFF ANIM format is a let down, but this is more than made up for by its exposure sheet. Highly recommended.

FANTAVISION

£50 Broderbund/HB Marketing
☎ 0753 686000

If you can't draw for toffee and can't afford a video digitiser, *Fantavision* could be for you. Unlike the rest of the packages featured, it uses an impressive image transformation system called 'Tweening' which removes much of the work involved in creating individual frames.

Tweening is nothing new – *DPaint*'s brush metamorphosis feature and 'Move' requester offer tweening facilities, but *Fantavision* takes the process to the limit by actually drawing complex frames for you. Instead of treating each object as nothing more than a bitmap, *Fantavision*'s objects are structured polygons manipulated by changing individual points. Say you draw a square on the screen. To *Fantavision*, your square is nothing more than four co-ordinates – one for the top left-hand corner, another for the bottom right-hand corner and so on. By altering the position of the points, *Fantavision* generates the frames needed to show the transformation between the shape of the original and the final object.

Tweening is by no means perfect though. *Fantavision* shares the lack of detail plaguing other polygon-based programs such as 3D games. As the objects you animate are not pixel-based, polygons are restricted to one colour and are independent of others. So if you want to create an animation of a face, several polygons have to be defined to form an object with more than one colour.

On the plus side, *Fantavision* animations are very smooth and easy to create. If you don't feel up to the task of full-blown animation, *Fantavision* is an ideal starting block. Quite impressive animations can be created in a matter of minutes. For beginners everywhere, *Fantavision* is a worthwhile consideration. AS

AND THE REST....

***AniMagic* –** Billed as a 'Digital Video Effects' system, *AniMagic* enables you to create animations which include effects such as tumbles, rolls and dissolves. Its rather difficult user interface lets it down, but it's still a powerful program. If you can live with its unfriendly front end, check it out.

***The Director 2* –** Programmers will probably get on a lot better with The Right Answers Group's *Director*, an animation scripting language which enables you to 'program' animations. Unfriendly it may be, but it oozes power.

***AnimBuild* (PD) –** *AnimBuild* is a PD program which animators on a budget may want to check out. You can't draw frames, add sound effects or anything as fancy as that, but for pulling together a series of picture files into an animation, it gets the job done.

CD WHIRL



What should you go for? – a CDTV or the new A570? Andy Storer look at the options plus all that's new on Amiga CD-ROM this month

At last month's European Computer Trade Show held in London, Commodore unveiled three new peripherals for CDTV. A 96-key QWERTY keyboard, a two-button mouse and a 1Mb 3.5" disk drive, all finished in black, will shortly be avaialble for CDTV owners looking to use their machine as a regular Amiga.

As it happens, the keyboard and drive have been around for some time now – priced at around £50 and £100 respectively; only the infra-red mouse – at another £50 – is hot off the production lines. Thus, if you've bought a CDTV for £500 you can now turn it into an Amiga for another £200!

So how does this compare to the equivalent of buying one of the new A570 CD-ROM drives? Although Commodore was hoping to bring the drive in at around £200 it now looks as though it'll cost £269. Add this to the price of an A500 Plus – £399 – and you're looking at £670 or so – just a teeny bit cheaper. What you get is more room for expansion and, of course, Workbench 2. What you don't get is an infra-red set-up that sits among the hi-fi.

FULL MOTION VIDEO

One or two readers have written in this month asking if and when Commodore intends to bring 'full video' to its CD machines. This stems from an article in March's *New Scientist* suggesting that in the US, Philips' rival CD-I system will be offering 'full length feature films' on a 12cm compact disk by next spring.

This is unlikely to be the case for a very good reason. For a good two years now, the Motion Pictures Experts Group (MPEG) has been meeting to agree on an image compression standard for digital video and is still some way off reaching a decision. The group, consisting of various international academic and leading corporate R&D chappies, is trying to set a standard – similar to the JPEG accord dealing with still photographic images – which will mean manufacturers have a common base for developing the chip sets for digital video machines.

Even at a conservative estimate, it will take at least another eighteen months for prototypes to emerge which feature MPEG standard full motion video. You can bet then, that Commodore will release a CDTV 2 featuring FMV, once agreement has been reached.

Although non-MPEG FMV does already exist – notably using Intel's Digital Video interactive (DVI) chips, the compression/decompression rates required for displaying full motion, full screen video are so heavy duty that they're beyond consumer price levels.

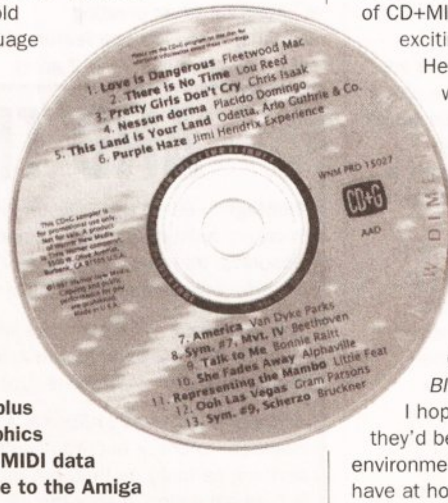
Consider the problems involved. A typical frame of broadcast TV takes up around 500K. And there are 25 of these making up a second's worth of full-motion. So you need to find a way of shifting 12.5Mb of code to screen memory every second. The answer of course is compression, but then the decompression has to take place in real time too!

So as a result, third party Commodore developers are homing in on quarter screen motion video. Companies like Optonica on 0455 558282 are offering CDTV mastering facilities whereby moving video of any gauge, from home to broadcast, can be overlayed onto full HAM backdrops and interleaved with lip synched audio. Optonica will be placing a floppy disk in the public domain shortly to show off its capabilities.

AMIGA CD SOUND

But it's actually in the sound department that some of the most innovative Amiga CD titles are emerging. Microdeal on 0726 68020 has released its *Voice Master* and *Asterix* French package which comprises a microphone and interface for CDTV which enables you to play back your own voice through your hi-fi as you attempt to copy the intonations of the Asterix characters.

There are over 60 minutes of spoken French from 30 different Gaullists with over 400 interactive cartoon drawings, complete English translation and over 1,500 vocabulary items. Two disks are avaiable for beginners and advanced speakers at £34.99 apiece. And great fun they are too – much more fun than the old language lab.



CD plus Graphics and MIDI data come to the Amiga courtesy of Warner New Media

But if you can't be bothered with French and you just fancy a good 'ole singalong then check out JB Marketing on 0530 61215. It has over 40 CDTV Karaoke disks on its books, each with 18 tracks for £39.99 a throw. There's everything from *Some Enchanted Evening* to *Like A Virgin* on offer but the accompanying graphics are a bit primitive.

Slightly more sophisticated in the graphics department, but not by a long chalk, are the range of CD+G disks from Warner New Media on 0101 955 9999. The 'G' stands for graphics – or what passes for graphics in 8-bit format – and this accompanies a mass of mainly classical titles selling for $19.99. Beethoven's in there, as is Mahler, Mozart, Prokofiev et al, and the displays can either show biographical or historical information about the piece you're listening to in glorious stereo. There are also disks from Hendrix, Fleetwood Mac, Little Feat and Lou Reed available too but the modern stuff does tend to come with pretty low-res screen designs. Pity really. But Warner's other offering with its range of CD+MIDI is an altogether more exciting proposition.



Just one of the 40 or so Karaoke disks avaialble for you to make a complete embarrassment of yourself on CDTV

Here you've got audio tracks with their MIDI equivalents so you can hook up your CDTV or A570 to your keyboard and see what, among other things, a piano solo sounds like as a sax. The first in an indefinite series is a disk containing selections from Gershwin's *Rhapsody in Blue* which sells for $39.99.

I hope these disks take off as they'd be great in a teaching environment, and let's face it, fun to have at home if you're lucky enough to have a MIDI set-up and a CD drive.

Laws for thought

Prior to a detailed new series explaining how you can make your Amiga artificially intelligent, Philip Gladwin sprints through the basics of a problem that doesn't get any easier...

OK, so why haven't we done it? Why haven't we got any artificial intelligence? Of course, that question depends on how you define non-artificial intelligence. Assume that you could make a machine which could beat all-comers at chess. Assume that you could build a chess-playing wunderkind that could predict blips on the Dow Jones Index on its days off. If you took this same brilliant machine into the centre of town, booted it out of the car, and told it to make its own way home, what do you reckon its chances would be? 0%? Less. You'd probably find it flailing its legs in the window display of the nearest china shop.

WHAT'S THE PROBLEM?

Thirty years of research have proved that we've got to redefine our ideas of what is *really* intelligent. It's only now we're realising that it's the little things, the things which we humans find easiest, that give so-called intelligent machines nervous breakdowns. For example, have you thought how hard it is to make a bed? On the face of it, it's a simple task, you have to be able to climb the stairs, you have to be able to find the bedroom, and the bed. You have to pull the duvet off, you have to be able to smooth the bottom sheet over the bed so that it lies just right, you have to tuck it in and fluff up the pillows...

No machine in the world can manage that simple task. And even if it could, if we were to let the situation become one for which the machine has not been specifically programmed, such as the pillow being trapped down between the headboard and the mattress, and your intelligent home help is rendered about as useful as the next lump of highly complex metal.

Real intelligence, in a nutshell, is an ability to adapt to the unexpected. A truly smart machine is therefore one that, whether it thinks in a way which mirrors our own thought processes, or whether it has a brain made up from higher order logic, is not a prodigy in one narrow subject but averagely competent at anything you care to throw at it.

This is the reason why artificial intelligence (or AI) is currently about as sexy as Catastrophe Theory. (Remember that old chestnut?) At the beginning of the eighties artificial intelligence was *big*. Ed Feigenbaum pointed out how the Japanese were about to jump into the lead with their Fifth Generation Project, MYCIN showed that Expert Systems had real potential; and suddenly a media obsession was born. But, a bit like fractals, there was only so much mileage to be had, and despite all the excitable claims in the early eighties, there is still a *long* way to go.

SO LOGICAL, YET...

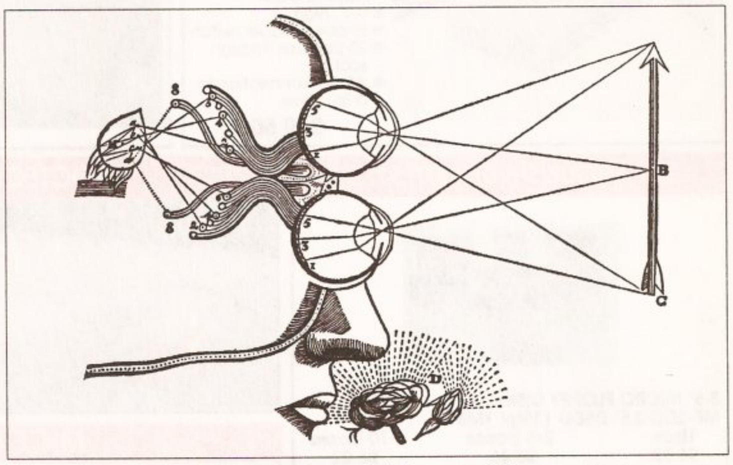
The big concern in artificial intelligence is knowledge representation. Given that we know an infinite number of things about the world, how do we write them down so that a machine can use them? Logic is one, very widely used, method.

Logic gives us a language which is almost as powerful as English, but totally precise. It's based on the premise that it is possible to represent objects as terms – such as x,y,z – and characteristics of objects as predicates – such as p(x),b(y,z), c(x,y,z...).

Given this, "rhino" translated into logic becomes rhino(X).

To represent more complicated ideas there are connectives such as AND, giving us angry(X) AND rhino(X) AND charging(X,Y) AND Ron(Y).

The other commonly used connectives are NOT, OR, and IF – which give us the ability to express even more complicated ideas, such as:



An early attempt by Descartes to explain human vision

IF ((gun(X) AND jammed(X))

OR (Ron(Y) AND frightened(Y) AND shoot(Y) AND miss(Y)))

NOT (dead(Z) AND rhino(Z))

Immediately you can see one of the problems with this sort of knowledge representation – the brackets! artificial intelligence is famous for 'em, and both of the computer languages commonly used in artificial intelligence – Prolog and Lisp – suffer from brackets piling up. The only consolation is that, as always, it gets easier to cope after a bit of practice.

LISTS AND BRACKETS

Lisp (LIst Processing) is one of the oldest computer languages around, and Prolog (PROgramming in LOGic) is a relative newcomer; between them, they constitute the two languages of choice for serious artificial intelligence.

Prolog and Lisp focus on being able to handle symbols rather than numbers, and as a result they are well suited to dealing with logical representations. Because you can define predicates in these languages as you go along, it's easy to express facts about objects and relationships between objects.

Lisp is a procedural language, which means that it makes the programmer describe in detail how a problem is to be solved. To write a Lisp program you need to write an algorithm just as you do in C or Basic.

Prolog is a declarative language, which means that, in theory, all you

JARGON BUSTING • JARGON BUSTING

Backward chaining – Starting from the goal you are trying to prove and using the facts in your knowledge base you reason backwards until you have arrived at the question.

DCG (Definite Clause Grammar) – currently one of the best methods of structuring your NLP program.

Deep thought – Named, presumably, after the computer in *The Hitchhikers Guide* that gave the number 42 a whole new significance, this is America's answer to Boris Spassky. Custom hardware, incredible software, supposedly the world's best chess computer.

Depth first search, Breadth first search, Hill climbing – Three of the many methods of searching the State Space. Which you use will depend on the problem you are trying to solve.

Forward chaining – The opposite of backward chaining.

MYCIN – The first successful expert system. Diagnosed illness. Asked questions about the patient's symptoms and trawled its knowledge base for diseases with similar symptoms.

Scripts – Every situation in daily life has a script attached to it: a clichéd description of the things you would expect to happen to you and the objects you would expect to find in this situation.

need to do is write down all the things that you know to be true about the problem you want to solve. Then, when you want to find out something – or more interestingly, when you want to deduce something – you just ask the system a question. Prolog is officially an Automated Theorem Prover. This means that it deduces things by applying rules ("if you do this that will happen") to facts ("X is a Y", "two Bs make a C"). Like I said, that's the theory.

AUTOMATIC THEOREM PROVING

There is a basic principle of Logic which states that either P or NOT P is always true: either the window is broken or it is not broken. One way to automate theorem proving is to take your hypothesis ("the window is broken"), and try to prove that its opposite ("the window is intact") is false. If you can do this, then you know that the window has to be broken, and your hypothesis is considered proved. Prolog works like this.

STATE OF THIS SPACE

The central idea in much of AI is the idea that all the steps you could take to solve a problem could be represented as points, or nodes, in a theoretical space. Eh? OK, imagine the antique problem of two missionaries trying to cross a river with two potential converts at a point where their only option is a boat big enough to hold two people. There's a culinary constraint operating – the potential converts are still cannibals, and there should never be more converts than missionaries on either side of the river. Assuming that all four of them can row, how should the missionaries schedule their boat trips so that there's no bloodshed?

In AI terms the missionaries, the cannibals and the boat constitute a system. The legal moves which you can make within this system are to row the boat between the banks carrying 1-2 people, obeying the constraint regarding the number of missionaries versus the number of cannibals.

The State Space is the set of possible states within the system. Assuming that they cross from the left bank of the river to the right bank, we can create a predicate called state (M,C,P). The first argument to this predicate is the number of missionaries on the right bank of the river, the second argument is the number of cannibals, the third is the position of the boat. The Start State is therefore state (2,2,L), and the Goal State is state (0,0,R). As you can see in the diagram at the foot of page 34, all these possible moves could be represented as a tree.

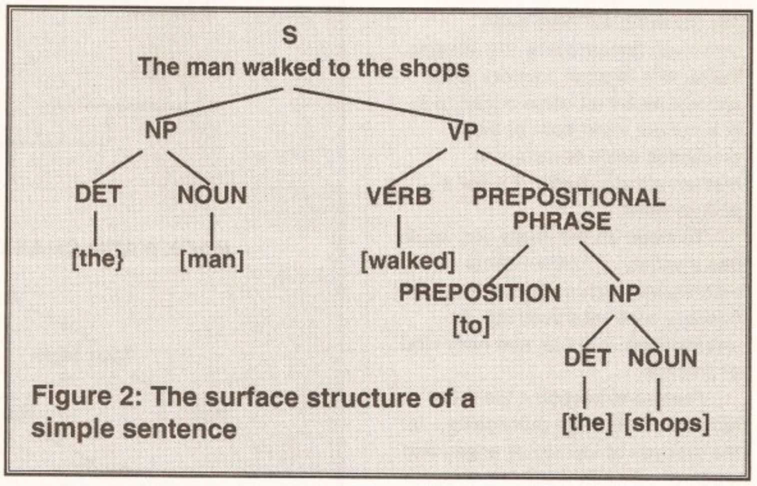


Figure 2: The surface structure of a simple sentence

Once you've done this it seems logical that you could write a program which could search the tree until it had found a route through the tree from the Start State to the Goal State.

RULES OF THUMB

In fact this is the approach taken by many artificial intelligence systems. In real life problems the number of paths possible soon exceeds the number of paths which could be searched in a useful time, and so a lot of work has gone into producing methods of searching the state space efficiently.

One way of cutting down the possible options is to have the program search according to rules of thumb called heuristics.

One heuristic you would use when you are looking for your car keys would be to look in the places in the house where you know you usually leave them. If the keys aren't there, a second heuristic would be to form a list of rooms which you went into immediately after coming home. If you can't remember having been in the spare bedroom recently then you would look there last. We use heuristics like this all the time in the real world, and if you're careful about them you can usually – not always – cut down your program's search time dramatically.

> ***"In AI, steps you can take to solve a problem can be represented as points in a theoretical space."***

DIRTY PICTURES

But all the rapid searching in the world can't help someone who doesn't know what they are looking at.

The first stage for any robot

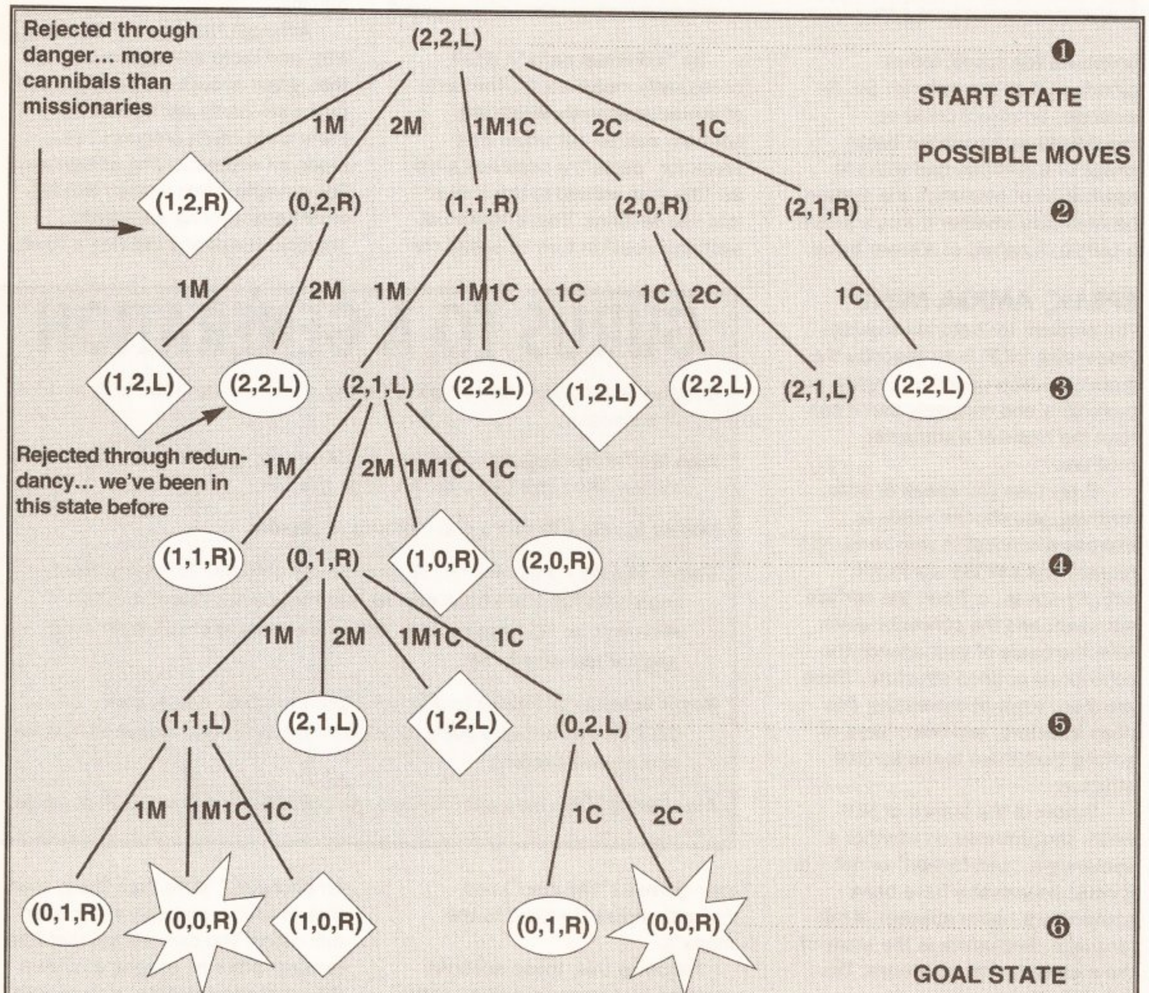


Figure 1: State space for the cannibals and missionaries problem

which wants to see is to produce a 2D image of a 3D world in the form of a matrix of grey level values. (I say grey level because most research work is done in monochrome – colour being just too complicated.) This Image must be processed to extract the features of interest. In theory, this can be done by reversing the processes that formed the image. The 3D world will have been convolved (smeared) by the imaging instrument (eyeball, camera lens), and will have had noise added to it. In a perfect world both of these processes could be reversed mathematically. Sadly, it's not a perfect world...

To clean up the image you would use a variety of mathematical techniques, such as high or low pass filtering, contrast stretching, or thresholding, in a trial and error kind of process.

Feature extraction – the most famous bit of image processing – is the process of identifying edges and areas of consistent texture. Imagine passing a "window", or mask, over the image.

The surface texture of the region you are currently looking at through the window is found by examining the statistical spread of the pixels there. Generally, if there are lots of pixels with very different values, you have a region of very rough texture, if there are many similar pixels then the texture is smooth.

In image processing terms, edges are generally the line where an area of one type of pixel meets another area of a different type of pixel. They are detected by a

> *"There is no program which can handle anything but a fraction of any natural language."*

mathematical method called convolution. Basically you would put your own edge into the window, and move it over the image until you find a correlation. These edges can then be followed, and described, and, using the texture information, regions grown to produce meaningful shapes.

But even with all this information, how do we know which objects these lines and shapes correspond to? After all, they could be covered in irregular shadows, have an unusual orientation, or be a long way away.

This is where heuristics come in – the biggest set of which deal with the effects of perspective.

This end of machine vision is wide open at the moment, but a dominant school of thought uses shape grammars. There are several ways of doing this – but most systems have a system of shape primitives (eg cubes, lumps, cylinders) they can refer to. So, for example, an object could be recognised as having the basic shape of a cylinder, and with the application of heuristics the system could decide whether it was a snake, a candle, a carrot, or a tower block.

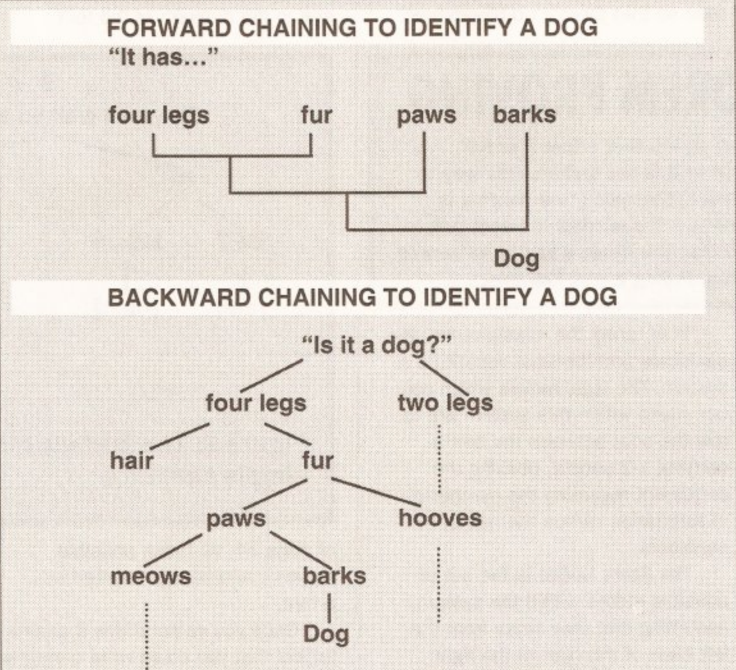


Figure 3: Inference strategies for an expert system

SPEAK, AMIGA MINE

The problem for Natural Language Processing (NLP) is to describe the grammar which underlies English so thoroughly and concisely that it can form the basis of a computer program.

Every time you speak or write anything, you choose words to express a concept in your head. NLP researchers call the words you actually speak, or hear, the surface structure, and the concepts which form the basis of your speech the conceptual or deep structure. There are many ways of expressing this deep structure, and many ways of getting from there to the surface structure.

Syntax is the branch of NLP which concentrates on whether a sentence is "well-formed" or not – ie it could conceivably have been spoken by a native speaker of the language. Semantics is the study of the meaning of the sentence. The principle of semantic compositionality is a theory which explains how we understand an infinitely large number of sentences – most of which, of course, we have never heard before – by processing them using a relatively small number of syntactic rules and then getting the meaning of the sentence from the sum of the individual parts.

By "individual parts" I don't necessarily mean words. The sorts of syntactic analysis which are normally carried out would first break (or "parse") a sentence such as "the man walked to the shops" into two sections. These individual sections would in turn be called the noun phrase ("The man") and the verb phrase ("walked to the shops").

Following this, these sections would be broken down further, until the syntactic analysis of the sentence would look like this:

- Sentence → Noun Phrase 1 (NP1) + Verb Phrase (VP)
- NP1 → Determiner ["the"] + Noun ["man"]
- VP → Verb ["walked"] + Prepositional Phrase ["to the shops"]
- PP → Preposition ["to"] + NP2 ["the shops"]
- NP2 → Det ["the"] + Noun ["shops"]

Most approaches to syntax end up producing rules that look something like this. The next step would be to produce a library of rules for all the types of sentences that your program is likely to encounter. There is no program in existence at the moment that can handle anything but a tiny fraction of any natural language, and most systems which have any success operate in a narrow domain where the subject matter and even the types of sentences that will be encountered are all decided in advance.

Finally you need to integrate the info you get from parsing with your conceptual structure for the text so far, so that the knowledge contained in the sentence can be used by the computer program to alter, say, the known positions of the man or the cat. This is much more complex, and far more disputed than simple parsing.

Although NLP has come a long way, and there are systems around that, given enough preparation, can parse any particular sentence, there's not much progress been made on understanding sentences. For example, "Ron walked into his local bank wearing a Margaret Thatcher mask and carrying a sawn off shot-gun." More than likely, even though you've probably never seen this before you can still tell that Ron is more intent on staging a hold-up than a political debate. How exactly you comprehend this is still very unclear.

GURUS TO A GENERATION

Douglas Hofstadter– Wrote *Godel, Escher, Bach... – The* book to relax an AI obsessive.

John McCarthy– Organised the first AI conference in 1956 with Marvin Minsky. Also invented Lisp. A founding father.

Donald Michie – Britain's most famous AI person.

Marvin Minsky – Put back the study of neural networks for nearly twenty years with his 1969 book proving that they couldn't work, but this shouldn't be held against him. One of the inspirational people in AI; another founding father.

Roger Schank– Did some terrific NLP stuff, invented Scripts, then decided that we were going to get nowhere until we understood how the human brain worked.

Alan Turing – The man who invented the computer and made it all possible.

KNOWLEDGE ENGINEERS

Expert Systems are programs which mimic the performance of a human expert in tasks which require knowledge and experience but are hard to describe in terms of conventional algorithms.

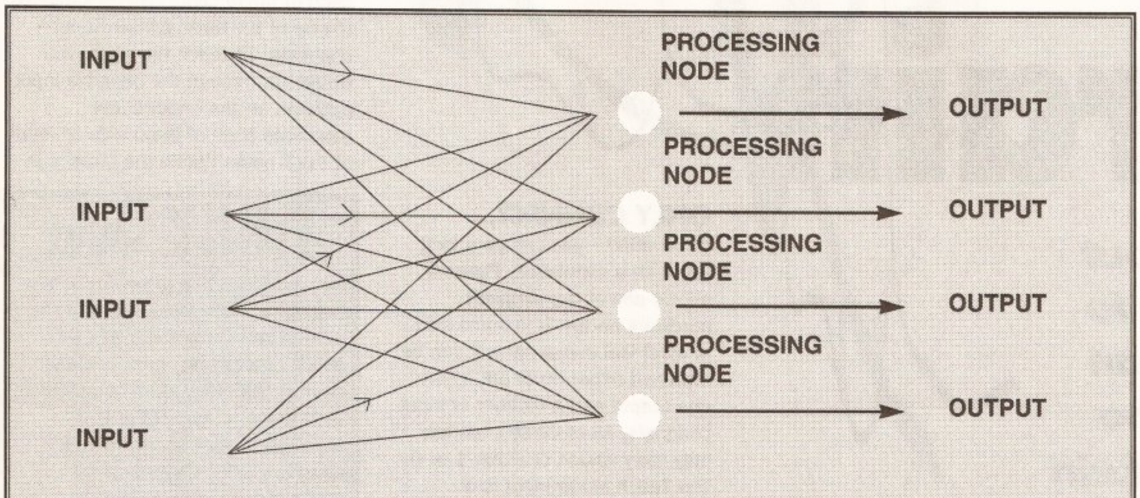


Figure 4: A single layer feed-forward neural net

To explain this, let's take the example of the personnel department of any large firm. This would receive hundreds, possibly thousands of CVs every year, and it would obviously be useful to automate as much of the repetitive work involved in processing them as was possible. The problem lies in the fact that the people who assess the CVs find it impossible to actually describe how they know if a CV is any good or not. Those responsible for assessing the CVs are skilled at forming an impression of a candidate from what is, to all intents and purposes, very flimsy evidence; subconsciously combining hundreds of heuristics and scraps of knowledge.

This is an area which it would be hopeless to approach with traditional computing, but is actually a prime target for an expert system. A knowledge engineer would interview the experts who usually carried out the job of screening the CVs and use a variety of psychologically based techniques to elicit as much information as possible about the heuristics used by the expert.

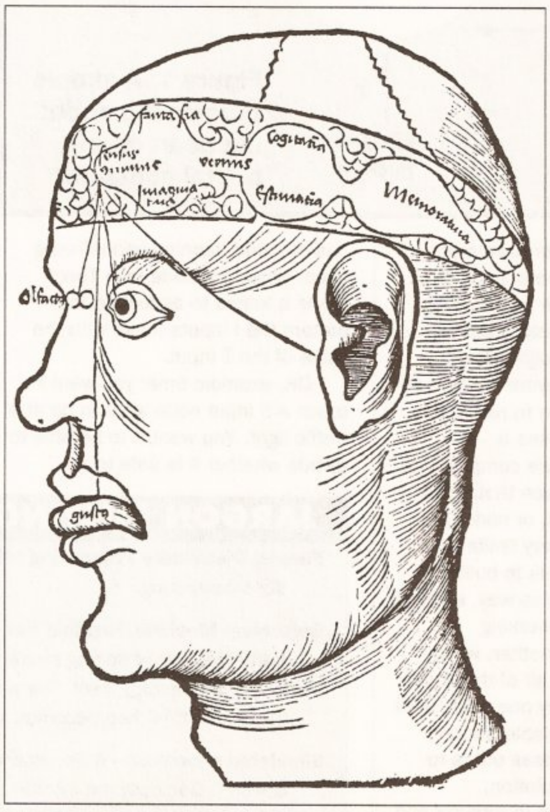
The knowledge base, one of the two main components of the expert system, would then be built to incorporate the knowledge engineer's findings, usually in rule form, looking something like :

```
IF age_of_candidate <19
    THEN candidate is Young
IF candidate has A level Physics
    THEN candidate is Scientist
IF candidate is Scientist
    AND candidate is Young
    THEN accept candidate
```

The inference engine is the other main component of an expert system. This is the supervising code which grinds away at the knowledge base. In this case it would probably take the CV as the starting point and, by substituting the data culled from it into the IF parts of the rules, find a path to either of the goal states of "Accept" or "Reject the candidate".

Expert systems (see figure 3 on page 36) traditionally have to have the ability to explain their conclusions and this is based on the analogy to human performance – you wouldn't trust an aero engineer who couldn't explain how his plane flew.

Generating meaningful explanations is a whole sub branch of artificial intelligence in itself, but normally the raw material for the explanation will be the trace – the list of rules that the system traversed in finding its goal state.



AI state of the art, circa 1504. Different areas of the brain are responsible for various sensory perceptions

MACHINES THAT LEARN

The problem with rule based programming is that the artificial intelligence achievable is limited by the things we can find rules for. But what are the rules you use for recognising, say, your bike from a row of others? If you parked it in a dodgy area (such as my old school bikesheds) there's a possibility that when you come back to it, it could be thoroughly mangled. Yet you would still be able to recognise it as being yours. A rule based system which had that amount of subtlety would have to spend an hour or two chasing through its knowledge base – but we can do the same task in a split second. Something is obviously amiss with conventional artificial intelligence.

That something is the human brain. We can learn a lot from the human brain – it can do all of the things that we're trying to do in artificial intelligence and on the whole it performs much better than our computers are able to.

Parallel distributed processing, or building neural nets, is an approach which sets out to learn as much as we can from the brain. (See figure 4 opposite). It involves building custom hardware which works in parallel, using networks of interconnected processing nodes. These nodes can be switched on and off, and are linked with different strengths, which are changed as the computer works. Although each node can't do much on its own, the fact that it works independently and simultaneously with the other nodes means that a large network built like this has potential for massively complex and subtle behaviour.

Systems like this aren't so much programmed as taught. At first, when the net is shown a set of training data, it will produce random output. Very quickly the weights within the net alter, nodes fire, and the net learns the features that compose the training set. After this it can be let loose on new, previously unseen data. These types of systems have the ability to generalise – moving from the information they have been explicitly taught until they can handle cases that they have not encountered before. As I said earlier, this is, in my view, the first real step towards machine intelligence.

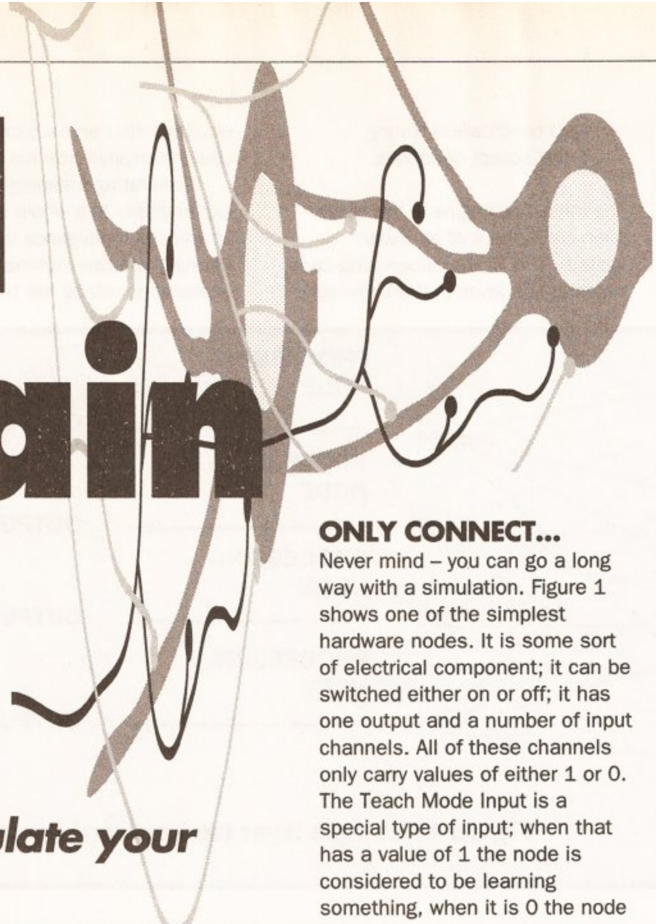
> ***"Systems have been built which recognise human faces and handwriting."***

There are drawbacks of course, such as the fact that it quickly gets very hard to understand what is going on inside the further corners of the network, and so, systems built in this way have the potential for unpredictable behaviour. Despite this, neural systems are the hottest research topic in AI at the moment and systems have been built that can recognise human faces, recognise different people's handwriting and even summarise simple stories.

DO IT YOURSELF

Next issue sees the start of a new series aimed at helping you build your own AI system. You will need a copy of Prolog for the Amiga – the only one I know about is in the public domain and costs pennies. It's called Stony Brook Prolog, in the Fish library, and I got mine from PD Direct (£1.50, ☎ 0782 208228). AS

Build a brain



Heard the fuss about neural nets? Want to know what they can do for you? Look no further, Philip Gladwin shows you how to simulate your brain with your Amiga

This month sees the start of a new mini-series aimed at demonstrating how to use your Amiga for leading edge neural net research. Well, almost. I'm going to be giving you the know-how to build a simple parallel distributed system or neural net which can be used for basic pattern recognition. Why bother? Well, if you've read the artificial intelligence feature on the previous four pages, you'll know that neural nets are the future. If you haven't and want to know more of the background to this column, then that's a good place to start.

WHICH NOISE ANNOYS?

Neural computing, or connectionism, is an attempt to get closer to how the human brain works. Our brains are spectacularly good at dealing with noisy input. Not just distorted sound waves, but noise in the wider sense. We can tell a house from an elephant, even in thick fog; we can recognise the faces of our nearest and dearest with make-up or woolly black beard, or even both; we can even eavesdrop on conversations on the far side of crowded bars if we really concentrate. This kind of performance was unattainable for the average AI system, until neural nets were investigated again at the beginning of the 1980s. After initial work in the early years of AI it took ten years or so to throw off the malign influence of a book written by Minsky and Papert in 1969 which, when cited (in the best research traditions, naturally) in attacks on targets its authors hadn't intended, proved conclusively that neural computing could never have much of a future. (A bit like the bumble-bee). In 1982, Bruce Wilkie and co built Wisard, a ground breaking pattern recogniser which brought neural computing back to centre stage, and the bandwagon began to roll again.

Connectionism uses a distributed architecture composed of tens, hundreds, or even thousands of simple processors, or nodes, acting according to very limited constraints. The aim is to build whole computers in this way, each of the hardware nodes working distinctly from one another, which means that some or all of the nodes could be active at any one time. Until this hardware is available the only way of trying these ideas out is to build a software simulation, processing each node in rotation and therefore, to some extent at least, missing the point.

ONLY CONNECT...

Never mind – you can go a long way with a simulation. Figure 1 shows one of the simplest hardware nodes. It is some sort of electrical component; it can be switched either on or off; it has one output and a number of input channels. All of these channels only carry values of either 1 or 0. The Teach Mode Input is a special type of input; when that has a value of 1 the node is considered to be learning something, when it is 0 the node has stopped learning and is being used. When the node is in Teach Mode it learns to associate the pattern the I Inputs make with the value of the T Input.

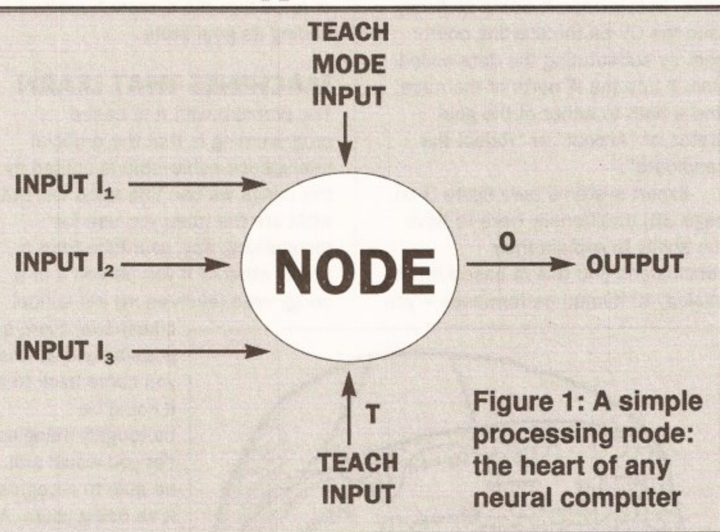


Figure 1: A simple processing node: the heart of any neural computer

OK, example time: you want to teach a 5 input node what to do at a traffic light. You want it to be able to decide whether it is safe to go through the light (which it will indicate by sending a 1 down its output channel) or stop at the light (output a 0).

First of all, set the Teach Mode Input to 1. You have three lights to consider, Red, Amber and Green. Each of these lights can be assigned to one of the three primary input channels. To teach the node, you would run through the possible input patterns for the I nodes and associate each of them with an input at the T node. (While the node is in Teach Mode it has no output.) In the case of a red light the I input pattern would be 1,0,0, and the input at the T Node would be 0. For a Red and Amber light the I inputs would be 1,1,0, and the T input would be 1 – and so on. The node is assumed to have just enough processing power to remember these associations of input and output.

When you decide the node knows everything it needs to about traffic lights you change the mode of operation of the node by switching the Teach Mode input to 0. From then on the node stops learning and starts considering what it will output down channel O. When it receives the input pattern 1,0,0 from the I channels it knows that it has to put out a 1 into channel O. It has been taught that a red light means Stop.

"So what's the big deal?" I hear you mutter. Well, when these nodes are linked together, their behaviour becomes *very* interesting. But more on that next month along with some AMOS code for your very own, fully auto-associative, pattern recognising, neural net. AS

THINK SMALL

Networks like this are only the very beginning. Estimates vary, but the human brain has well over 10 billion processing units, and each neuron has many more connections than these nodes. There is a research project underway which aims to produce a map of the connections in the brain of an earthworm. Even this, trivial as it sounds, is a long term proposition.

JARGON BUSTING • JARGON BUSTING

Parallel Distributed Processing (PDP) – One of the many names for neural style computing.

Boltzmann Machine, Hopfield Net – Neural nets which work around a particular way of seeing neural nets: when a net is given a problem it has a high energy level. The process of solving the problem and settling into a solution then becomes settling into a low energy state.

Simulated annealing – A Boltzmann Machine has this; a Hopfield net doesn't. Basically the introduction of a random factor to ensure that, as the net settles into a solution, it doesn't get stuck at an energy level a long way from the bottom.

MEMORY EXPANSION

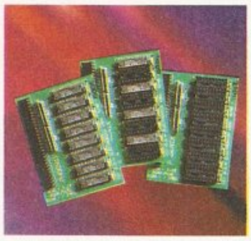
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AMIGA RELEASE 2



The long awaited Upgrade kit for 1.2/1.3 owners from Commodore has finally arrived and is selling fast.

We have managed to secure one of the largest stocks of this product in the whole of the UK.The package comprises 2.04 ROM chip, all Workbench software (Install disk, Workbench 2.04 disk, Fonts disk and Extras disk.) a huge fully bound highly informative instructional/technical manual covering every aspect of the 2.04 operating system plus an additional "Getting Started" manual, a step by step guide to Workbench 2.04. This is the essential upgrade kit direct from PHOENIX. Please note that due to the excessive weight of this item, we have to charge £2.50 P+P on all orders.

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PHOENIX have bulk buying power which means that prices frequently change. These prices are accurate at the time of going to press but please call for the best deals. Quantity discounts are also available on some chips so please ask.

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see the new *Amiga*

Rumours have been circulating for months about a possible new affordable Amiga – and now you can be among the first people to see it for yourself. Commodore has announced that the official launch of the new machine, called the A600, will be at the Amiga Shopper Show on May 15-17.

The announcement confirms that the Amiga Shopper Show is the premier event of the spring. Also being launched at the show is the A570 (formerly the A690) CD-ROM drive for the A500.

AMIGA SHOPPER SHOW

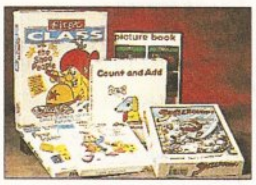
WEMBLEY EXHIBITION CENTRE • MAY 15 - 17

Dozens of hardware and software companies, book publishers and dealers will be at the show. This is just part of the list: Commodore, Ashcom, AdventureSoft, Bitcon, Bruce Smith Books, Citizen, Computer Books, Connect, Cortex, Digita, Evesham Micros, FMG, Fujitsu, Future World, GVP, Gasteiner, Golden Image, George Thompson Services, Harde Cache, HiSoft, JAM, Kador, Media Ware, New Dimensions, Pacific Digital, Power Computing, Precision, Progressive Peripherals, Rombo, Silica, Supra, Videk, WTS, Zone Distribution... and many, many more.

As well as the exhibitors, Amiga Shopper will be hosting a series of seminars on topics ranging from programming to DeluxePaint. And there will be question and answer sessions with the Amiga Shopper experts, and a chance to talk about the magazine to the team which produces it.

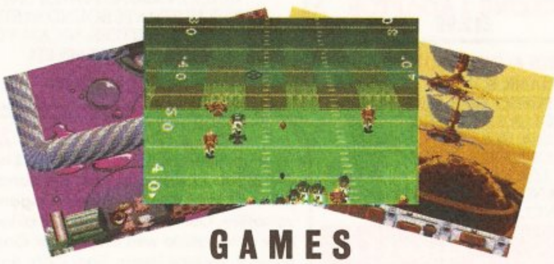
If you've ever fancied experiencing virtual reality, the Amiga Shopper Show will be your chance, with the opportunity to lose yourself inside an incredible computer generated world. And gamers will have the chance to win prizes for getting the high score on the latest games from Ocean, US Gold, Psygnosis, Electronic Arts and many others in the Amiga Power Games Arcade.

New launches, lots to see, great bargains, informed seminars, stunning entertainment: the Amiga Shopper Show is the best day out for Amiga owners this year. So order your tickets now using the form on the left or dial the credit card hotline number. Either way, you save money, and you'll get a full show guide sent to you before the event!



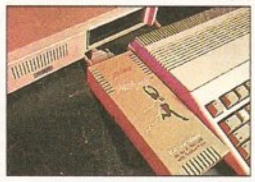
SOFTWARE

See the latest products from the likes of Digita, HiSoft and Precision. Test them out for your self, then pick the one you want...



GAMES

The Amiga Power games arcade will feature only the latest and best games – and you'll have the chance to play them yourself.



HARDWARE

Powerful hardware which will transform you Amiga will be on display and on sale, including devices from Supra, GVP, Gasteiner and more...

OPENING HOURS The Amiga Shopper Show is being held at the Wembley Exhibition Centre, London, on these dates: Friday May 15th, 9am - 5.30pm ● Saturday May 16th, 9am - 5.30pm ● Sunday May 17th, 9am - 4pm

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We can install a rom sharer, with 1.3 workbench rom, & if you need more faast ram, our Baseboard Plus memory upgrade. There is no fitting charge if done prior to purchase, however, the Commodore warranty will be invalidated, so we recommend an Extended warranty be taken out.

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E MOTION
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PHILIPS CM8833 mk 2 UK MODEL with F19 & On site warranty	£239.99
COMMODORE 1084Sdi - new model	£249.99
AOC CM326 MULTISYNC HIRES	£339.99

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AL6B fomew CPC monitor with stereo sound	£12.99
AL7 for 1084 monitor inc audiolead (6pin Din plug)	£14.99
AL7P for new 8833/1084s - 9 pin D plug	£14.99
AL11 for multisync with 9 pin skt on monitor	£11.99
AL11B for multisync with 9 pin plug on monitor	£11.99
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AL13 for multisync (our lead has 15 pin HD plug)	£13.99
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Many other leads available - please phone.
All leads include audio lead where applicable & are approx 1.8m long. Add £1.50 per metre for longer leads.

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DATAFLYER 2000S 105meg scsi	£389.99*
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Available soon - IDE version with 8meg on board ram option, & external power supply.

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DATAFLYER 2000I IDE INTERFACE	£84.99 NEW

* DRIVE SIZES QUOTED ARE APPROXIMATE FORMATTED SIZES & MAY VARY SLIGHTLY DEPENDING UPON MAKE OF DRIVE FITTED. New IDE versions work with most IDE drives.

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GVP SERIES II HD8+ 52 Quantum for A500	£359.99
GVP SERIES II HD8+ 105 Quantum for A500	£469.99
GVP SERIES II HC8 no drive/ for 1500/2000	£139.99
GVP HD8+ PC286 EMULATOR MODULE	£239.99

PRINTERS

Prices are for b/w versions

CITIZEN 120D+ now down in price	£129.99
CITIZEN 124D - best budget 24 pin b/w	£194.99
CITIZEN 224D (24pin - colour option)	£224.99
CITIZEN SWIFT 9 (colour option)	£177.99
CITIZEN SWIFT 9X B/W wide carriage	£257.99
CITIZEN SWIFT 24E (colour option)	£269.99
CITIZEN SWIFT 24X wide carriage	£379.99
CITIZEN PRODOT 9 - PROF QUALITY	£199.99

FOR COLOUR KIT to convert 224D, SWIFT 9, PRODOT 9 & SWIFT 24, to colour, add just £20.00. Add £30 for colour kit for 9X & 24x. (Colour kit contains ribbon & ribbon motor unit)

CITIZEN PROJET INKJET PRINTER	£399.99**
CANON BUBBLEJET BJ10EX	£269.99

STAR PRINTERS

STAR LC20 b/w now down in price	£144.99
STAR LC200 colour	£209.99
STAR LC24-200 b/w	£239.99
STAR LC24-200 colour	£299.99

FREE PRINTER CABLE & DRIVER DISK WITH ALL PRINTERS

PRINTER ACCESSORIES

UNIVERSAL PRINTER STAND - open frame type with paper holder for all 80 column printers.	£12.99
TWO PIECE PRINTER STAND for any printer	£7.99
80 COLUMN PRINTER DUST COVER state printer	£7.99
COPY HOLD - FREE STANDING OR CLAMP	£16.99
60grm Fan fold 11x9.5" paper in box of 2000 sheets	£21.99
A4 60grm white paper in packs of 500 sheets	£5.99
AMIGA PRINTER PORTEXTENDER - 2WAY	£24.99
AMIGA PRINTER PORT EXTENDER - 3WAY	£27.99
AMIGA PRINTER PORT EXTENDER - 4WAY	£33.99

Above Printer port switch prices include cable worth £10.99 to connect switch to Amiga. These switches are fitted with sockets identical to the Amiga's printer port - so your printer cables & other peripherals just plug straight in.

PRINTER SHARER - 2WAY inc free lead	£27.99
PRINTER SHARER - 3WAY inc free lead	£29.99
PRINTER SHARER - 4WAY inc free lead	£34.99

These have sockets as fitted to printers (36w centronics) & enable one printer to be used with several computers. Lead to connect switch to printer included.

AMIGA PRINTER LEADS

AMP1 1.8m long for all parallel printers	£9.99
AMP 2 3m long for all parallel printers	£12.99
AMP 3 5m long for all parallel printers	£16.99
PRINTER PORT EXTENSION LEAD (M-F)	£10.99
PRINTER PORT TO SWITCH LEAD (M-M)	£10.99

PRINTER RIBBONS (Compatible types)

9 PIN B/W 80 column ribbon - state printer - available for popular Amstrad, Citizen, Panasonic, & Star	£4.99
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Swift 9 & 24 Colour ribbon (Citizen brand)	£15.99
Star LC200 & LC24-200 Colour ribbon (Star brand)	£15.99
RIBBON RE-INKING SPRAY - BLACK ONLY	£13.99

Use a redundant XT drive on an Amiga500.

The Cumana ST506 xt Drive interface with 1/2meg ram & on board clock, fits into the 1/2 meg slot, & enables most ST506/ST412 drives to be used. (Drive power supply & housing not included) £79.99

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A590 + (no ram) 20meg Hard drive	£279.99 *
A590 inc 1meg ram	£309.99
A590+ inc 2meg ram	£339.99
A590 45meg SCSI upgrade - easy to fit	£199.99
A590 105meg SCSI upgrade - easy to fit	£329.99

AMIGA 500 1.3 Base Model

Amiga 500, 512k ram, workbench 1.3, psu, mouse, tv modulator & instruction manuals. No extra software. Add £20 for extra 1/2 meg (without clock) ONLY £289.99**

SPECIAL BONUS PACK.

AMIGA 500 1.3 as above + PHOTON PAINT 2 + GFA BASIC+ TEN STAR GAMES PACK (games only - excludes accessories) £299.99
HURRY - Limited stocks.

AMIGA 1500 Wkbench 2 £559.99

With 1meg ram, twin disk drives. + Software pack comprising: Dpaint 3, Home Accounts, The Works, Elf, Toki, Puzznic & 'Get the Most from Your Amiga'.
Deduct £60 if software pack not required.

EXTERNAL DRIVES.

ROCLITE RF382C	£58.99
ROCTEC 5¹/₄" DRIVE	£79.99
CUMANA CAX 354	£58.99

All are Amiga PLUS, 600 & CDTV compatible.
All drives feature thru port & disable switch.

MEMORY UPGRADES

A500 1/2megwithout clock	£23.99
A500 1/2megupgrade with clock	£27.99

LOW POWER, 4 CHIP DESIGN, WITH ON/OFF SWITCH.
Just plug in, warranty unaffected, Amiga Plus compatible.

NEED EVEN MORE MEMORY ? Then fit a...

BASEBOARD 0.5 TO 4 MEG UPGRADE for Amiga 500

BASEBOARD UNPOPULATED	£79.99
BASEBOARD WITH 1MEG special price	£99.99
BASEBOARD WITH 2 MEGS	£139.99
BASEBOARD WITH 4 MEGS	£219.99
ZYDEC 1.5MEG UPGRADE	£79.99

Internal fitting, invalidates warranty.

AMIGA 500 PLUS 1 meg upgrade £44.99
Just plugs in. No soldering. Warranty unaffected. Gives you 2 megs in total. (Made by Phoenix)

NOT ENOUGH FAST RAM ? You need a...

BASEBOARD PLUS 1 - 4 MEG UPGRADE.

BASEBOARD PLUS - 1MEG	£99.99
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BASEBOARD PLUS - 4 MEG	£219.99

Internal fitting - invalidates warranty - but can be covered by our Extended warranty plan, taken out at time of fitting.

AMIGA 1500 & 2000 UPGRADES.

2-8 MEG RAM CARD (unpopulated) £79.99
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Our Extended Warranty & Insurance plan could save you ££s on accident & repair bills.

When you buy any computer, printer or monitor from us, we can offer you a low cost Extended Warranty with Accidental Damage Insurance. Underwritten by a leading Uk Insurance company. For example your Amiga 500 can be covered for three years from date of purchase for only £44.99, or £64.99 for five years from date of purchase. Covers all repairs & accidental damage, with very few exclusions. Must be taken out within 30 days of purchase. ***Atypical Amiga repair costs at least £45 - & that's at today's prices - so you can't go wrong!***

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If you are an OAP or Bona fide full time higher education student (uni, college or poly), we will give you at least 2¹/₂% discount off most items. Bring your Pension book, Student's Union card or Student Poll tax card if calling, or send a signed photocopy, & payment by Cheque, cash or PO only (not credit card). Please confirm price & availability first.

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KCS Power PC Board

PC EMULATION FOR YOUR AMIGA

SEE US AT AMIGA SHOPPER SHOW STAND D32

About....

The KCS Power PC board is a complete #11Mhz 1Mb PC sub-system that can be fitted to any Amiga in minutes.

Based around NEC's highly successful V30 CPU, the Power PC Board offers a very high degree of compatibility at machine language level, yet runs faster than an equivalent Intel 8086.

The 1Mb of Autoconfig™ memory can be accessed by all current Amiga models including the A500 Plus. Even the original A500 can access 512K as a standard expansion with clock; plus a 512K RAM disk.

Adored by critics and users alike, the KCS Power PC Board is a real alternative to buying a complete PC clone.

Installation

The KCS Power PC board fits to any Amiga in minutes:

- On A500 and A500 Plus machines it simply slides into the trapdoor expansion; and doesn't invalidate your warranty!
- On bigger Amigas, such as the 1500/2000/2500/3000, it drops into a vacant Amiga slot using the custom designed adaptor board.
- Once fitted, your Amiga can be switched into PC mode simply by clicking an Icon. Just reset and it's an Amiga again.

No fuss, no hassle. Just two machines in the space of one.

Video

- Supports the majority of EGA and VGA modes in 16 glorious colours and monochrome - graphics up to 640x480 and text too. Interlace is required for some modes but a software flicker fixer is built in.
- Other video modes include MDA and CGA text and graphics. Also supports Tandy colour graphics adaptor and Hercules monochrome.
- EGA and VGA graphics can be displayed on a domestic TV or monitor. Unlike *real* PC's, no extra hardware is required.

Disk

- Up to four Amiga drives can be connected to your system and accessed in PC modes as 3.5" 720K or 5.25" 360K. Typical disk access is at least twice as fast as most real PC clones!
- DOS can be started from any mounted drive 5.25" or 3.5" and most Amiga hard drives.
- Supports most popular hard disks including GVP Impact, Supra and A590 (Omtl and SCSI).
- A massive 200K ramdrive (up to 8Mb with expansion) is available in PC mode and it's PC-reset proof too.

Memory

- Even with a base Amiga 704K is free for DOS programs (640K in EGA and VGA modes).
- EMS (expanded memory) is supported allowing you to run Microsoft Windows without problems and store massive files in Lotus 1-2-3. So, if you have 8Mb on board, the PC can use it.
- XMS (extended mrmory) is supported - even though this is not usually possible on NEC V30 machines.

Speed

Its Landmark speed puts it way ahead of many true PC systems - it even compares favourably with many AT clones.

However, the crux of the matter lies with the video speed; and this, as many critics have noted is where the KCS Power PC Board scores over all others. It's no use having a wizz-bang processor if the screen takes several seconds to redraw itself.

- Tests in text modes have shown it is several times faster than even AT clones with dedicated video hardware. Even in graphics modes, it's no slouch although the emulation is limited by Amiga hardware.
- Add a processor accelerator card, and the 32-bit clean KCS cache software will use it to its full advantage.

Mouse

- Automatic serial mouse emulation is supplied as standard - using your existing Amiga rodent.
- Mouse can be configured as COM1 or COM2.

Joystick

- Up to two sticks can be employed at any time. You decide how they are arranged.

Printer

- Your Amiga's parallel port is accessed as LPT1 in PC mode.

Serial

- DOS usually supports two serial ports, but one is taken by the Amiga mouse. The Amiga's serial can be set as COM1 or COM2 as desired, ie for MODEM etc, up to 19200 baud full-duplex.

Sound

- PC sound is supported, but there's an additional volume control available in software.

Works On....

- All Amigas (except the A1000) fitted with Kickstart 1.2 and Workbench 1.2 or higher.
- Extra memory is not required, but full use will be made of extra hardware, like accelerators, flicker fixers, modems etc.

Help!

- We want you to get the most out of your system so we offer a comprehensive, free telephone helpline service to all registered users.

Updates....

- Since the hardware is a complete PC in its own right, all updates are completely software driven. Registered users can update at any time for a nominal fee to cover media and shipping costs.

"PC emulation is a contentious issue - but the KCS Power PC board is the only one to carry my personal recommendation. It is an excellent product that does all it claims and does it well."
comments Mark Smiddy, co-author of Mastering AmigaDOS 2.

PRICE

including MS-DOS and on-board memory	**£219.95** inc VAT/Carr
Excluding MS-DOS but incl on-board memory	**£189.95** inc VAT/Carr
Adaptor for 1500/2000/3000	**£74.95 inc.**

AVAILABLE FROM YOUR LOCAL COMPUTER SHOP (IF NOT - ASK THEM WHY NOT) OR DIRECT FROM BITCON.

BDL BITCON DEVICES LTD.
88 BEWICK ROAD, GATESHEAD, TYNE & WEAR, NE8 1RS ENGLAND
TEL: (091) 490 1919, HELPLINE (091) 490 0202
FAX: (091) 490 1918
VISA Access

Compatibility is excellent but no-one can guarantee every single program available, therefore if your purchase depends on a particular program, please ask us first or send in a copy of the program. (With suitable S.A.E. if to be returned). Price subject to change without notice.

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Clumber House, 56 Clumber Street, Kirkby - in - Ashfield, Notts NG17 7NG Tel/Fax (0623) 720659

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TERMS AND CONDITIONS:
All prices are inclusive of VAT at the current rate and UK postage and packing. All products are offered subject to availability. Please make all cheques payable to OPTION 2000 and allow 5 working days for clearance. Please ring for prices of goods not shown. All prices are correct at time of going to press but please note that prices may change.

AMISPEED

Amispeed guarantees **LOWEST** prices ever! You send us the ad of a rival company, the lowest price you can find and we will deduct 10% off the price listed in that very advert on the same product.

You pay 50% after a week hands-on experience with your newly acquired hardware. If you are not satisfied, merrily send it back! Downpayment 50% of the total price to ensure you are serious. We are!

Amispeed provides 680 XD boards including 040, all hard drives, all memory expansions, all digitisers, all 24 bit cards, all fully warranted.

Write or call for information on the product you need. It will pay off!

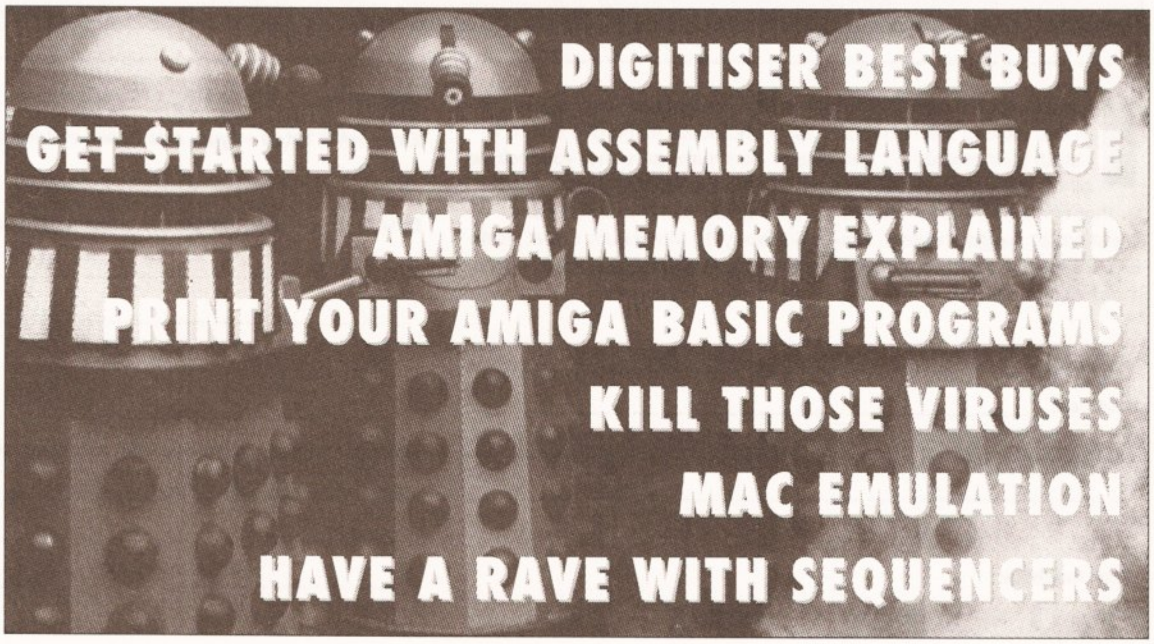
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CONTENTS AT-A-GLANCE

OUR EXPERTS TACKLE YOUR REAL-LIFE PROBLEMS

AMIGA ANSWERS

PROBLEM WITH YOUR PRINTER? WE'LL BLOW IT AWAY FOR YOU



ALL YOUR PROBLEMS EXTERMINATED

SO WHAT DO ALL THOSE ICONS MEAN?

Beginners: this icon will appear next to any questions which are 'basic' in content.

General: this icon is used for any general Amiga-related queries.

Caution: be sure that you fully understand the answer before trying it out.

Danger: the answer to this question could well invalidate your warranty – or you!

Hardware: this icon is used to denote questions relating to general hardware.

Buying advice: we use this icon if the question asks us for buying advice.

Printers: this icon denotes a query about printers, printer drivers and so on.

Technical: any queries about programming will have this icon next to them.

Video: this icon relates to any query about using your Amiga with video hardware.

Music: this icon is for questions about MIDI, sampling, synthesizers and so on.

Programs: any program-specific queries have this icon next to them.

Comms: if your question relates to comms, this is the icon that we'll use.

WHATEVER YOUR PROBLEM WITH THE AMIGA, WE ARE HERE TO SOLVE IT

That's the task we have set ourselves in giving you the best possible support for your Amiga. We are confident that our experts can cope with any technical questions you can throw at them. If they don't already know the answer to your problem, they will find it out for you.

We are prepared to deal with any problem you have with the Amiga, from general enquiries about AmigaDOS or Workbench, through questions about specific pieces of software and hardware, to advice on what you need to buy to do a particular task. If it's to do with the Amiga, we will help out. What we cannot do is offer this service over the telephone – do not phone us with your enquiries, but write to us at the address below.

We also cannot enter into personal correspondence – all enquiries will be dealt with in the pages of the magazine. This does mean a bit of a delay in solving your problem, but you'll just have to be a little patient and wait for it to appear in print. You won't get a personal reply even if you enclose an SAE with your letter, so please don't bother.

Send your question on the form below to: Amiga Answers, *Amiga Shopper*, Beauford Court, 30 Monmouth Street, Bath BA1 2BW.

The Amiga Answers panel consists of our consultant editors Mark Smiddy and Jeff Walker – and, of course, our resident deputy editor Cliff Ramshaw. We will also be calling on the services of all our other contributors, so you won't be able to catch us napping whatever the subject of your query.

Each panelist will be dealing with queries in their own specialist area(s) so it would help us greatly if, when writing, you label your query envelope with the name of the expert who can solve your particular problem.

Below is a list of areas of expertise. It's a list that we will add to and update every month, so you will know who to write to about any subjects not mentioned here.

Gary Whiteley –	**Video**
Paul Overaa –	**Programming, music**
Mick Draycott –	**Hardware, programming, MIDI**
Jeff Walker –	**Desktop publishing, programming**
Mark Smiddy –	**AmigaDOS, business, CDTV, hardware projects, hard and floppy disk drives**
Jason Holborn –	**Public Domain, AMOS**
Jolyon Ralph –	**Programming, hardware, CDTV**
Cliff Ramshaw –	**The really hard stuff that no-one else can answer**

If you send in a question for the Amiga Answers experts, please fill in and include the form below (or a photocopy if you don't want to cut up your magazine). And please also make sure that you include all the relevant details – version numbers of software and so on – so that we have the best chance of helping you. Send your form and question to: Amiga Answers, *Amiga Shopper*, 30 Monmouth Street, Bath BA1 2BW. Sorry, but we cannot personally reply to any questions – even if you include an SAE.

Name: ______________________

Address: ______________________

____

____

Your machine:

A500 ☐ **A1000** ☐ **A1500** ☐

A2000 ☐ **A3000** ☐

Approximate age of machine: __________

Kickstart version (displayed at the 'Insert Workbench' prompt)

1.2 ☐ **1.3** ☐ **2.x** ☐

Workbench revision (written on the Workbench disk)

1.2 ☐ **1.3** ☐ **1.3.2** ☐ **2.x** ☐

PCB revision (if known). Do not take you machine apart just to look for this! __________

Total memory fitted (see AVAIL in Shell for 1.3 Workbench) ______

Chip memory available (see AVAIL in Shell) __________

Agnus chip (if known) __________

Extra drive #1 (3.5"/5.25") as DF_: Manufacturer __________

Extra drive #2 (3.5"/5.25") as DF_: Manufacturer __________

Hard disk: ____Mb as DH__: Manufacturer __________

Extra RAM fitted – type, size in Mb and manufacturer __________

Details of any other hardware which could help us to answer your question:

____

____

____

____

Now, use this space to describe your problem, including as much relevant information as possible. Please continue on a separate sheet if necessary.

____

AS 14

NO PROBLEM!

Hi, and welcome to another bumper crop of *Amiga Answers*. Every month we devote more space and apply more resources than any other Amiga magazine to solving your problems. We receive something like 100 queries a week, so the service is obviously appreciated.

It's my job to co-ordinate the whole thing: sorting through the questions and sending them off to the relevant chappies for the kind of in-depth answers you've come to expect; and compiling them into the lovingly crafted pages which you see before you.

I call on a wide variety of expertise to make sure you get the answers you need, which is why *Amiga Answers* is so successful. There's Mark Smiddy, industry guru, AmigaDOS-tamer and business applications wizard; Jeff Walker, probably the most knowledgeable Amiga desktop publisher there is; and Jason Holborn, long-time AMOS explorer and PD sampler, as well as good all-rounder (or should that be all round good guy?).

If it's a question about video, then I'll pass it on to Gary Whiteley, our professional videographer for whom the word 'genlock' means 'mixing Amiga graphics with video for magical results' and for whom the word 'snipwirral' means nothing at all.

Programming queries are dealt with by Paul Overaa, who's not afraid to code in any language, and who doubles as a MIDI maestro to solve your sequencing slip-ups.

Our hardware guru is Jolyon Ralph. This man knows just about everything about disks, both hard and floppy, and what he doesn't know about memory he's probably forgotten.

All in all, a formidable team, supplemented by my own not inconsiderable Amiga suss. Let's face it, if we can't answer your question, it's probably one of the Mysteries of the Universe.

This month we point a host of people in the right direction for printer drivers; we offer advice on the best digitiser; describe how to transfer files from an Apple Mac to an Amiga; advise how to get started with assembly language programming; explain the differences between the various types of Amiga memory; outline the procedure for getting a print-out of an Amiga Basic program; help someone to link two Amigas via modem.

What's more, we finger a *Lamer Exterminator* virus; extol the virtues of *TurboPrint Professional*; and much, much more.

So, if you have a problem, send it to us and we'll exterminate it with a zap of logic.

Cheers,

Cliff Ramshaw

THREE'S A CROWD



I have three annoying problems regarding my system – an Amiga 500, 512K memory expansion, A590 hard drive with 1Mb memory, external floppy drive and a Star LC24-200 printer.

I use my computer and printer with *Professional Page 2.0* to produce various newsletters and programmes for a theatrical society. My problem is that I can't print the full width of my page. The program seems to chop off the last 6mm at the right-hand side.

The second problem also concerns *Professional Page* and takes the form of the writing on the gadgets in various parts of the program being displaced by about 5mm to the right. This isn't so bad, but it is annoying.

My last problem is that although I am never likely to need to use the bitmapped fonts that come with *Professional Page*, and knowing that they must take up a fair bit of space on the hard drive, I found that even though the manual described a way of leaving them out of the installation procedure the program simply won't load without them being present. I realise that I am probably missing something basic, but for the life of me I can't tell what it is.

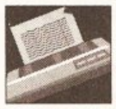
W Craig Macbeth
Glasgow
Scotland

The Star LC24-200 has a maximum 8in print width, which is why it is cutting off the right-hand part of your pages. To cure the problem reduce your page width in *Professional Page*. The second problem you mention is probably a small superficial bug in *Professional Page*; to be honest I don't understand what you are saying, but perhaps you should report it to Gold Disk.

Why are you still using 2.0? You should have upgraded to 2.1 yonks ago, it is much faster and takes up much less of your hard drive. We're up to 3.0 now. Register today!

To stop *Professional Page* from attempting to load the bitmap fonts, click once on the program icon, select Info from the Workbench menu, change the Tool Type that says FONTS=ALL to FONTS=CG, and select Save. After this *Professional Page* will only look for Compugraphic fonts when it loads. ***JW***

BAD ADVICE



After buying an Integrex ColourJet 132 printer second-hand, no manuals, the best quality I have managed is 'poor', using the Quadram_Quadjet driver, example enclosed. All other drivers fail to work.

Shops have advised me that I am using the correct driver, but 83 by 84 dpi is not good enough for me. Do you know of a driver which will increase the quality of my printouts?

David Green
Bowthorpe
Norwich

The shops have advised you badly; the correct printer driver to use with the ColourJet 132 is the one supplied by Integrex (☎ 0283 551551). It costs £54.05 (including VAT and P&P) and can be bought direct from Integrex Ltd, Church Gresley, Swadlincote, Derbyshire DE11 9PT.

This driver works in the ColourJet's high resolution mode, so the output will be very dark unless you are using special paper which causes the ink to dry the moment it hits the paper. The type of paper you need is known as 'high performance inkjet paper', and it is *not* the same as the stuff sold for the Hewlett-Packard DeskJet and Xerox 4020 inkjets – these papers are not of a high enough quality.

There are various brands of high performance inkjet paper; all of them are of Japanese origin, I believe. The two brands I have used are made by Sharp (for its JX inkjets) and Genuine Diablo Supplies. It's more than likely that you'll need to visit one of the bigger stationers, I doubt if a small High Street outfit will carry these brands.

Be prepared – high performance inkjet paper is not cheap. ***JW***

PP-PROBLEMS



I want to produce a disk-based magazine based on the *PPMore* and *PPShow* utilities. My question is this – how do I give a text file an icon and then set its path to *PPMore* so that it is displayed when the user clicks on it? I've worked out how to do this with pictures, but I'm having problems with text files.

Gary Shaw
Mexborough
S Yorkshire

Attaching an icon to a text file is exactly the same as the process involved in attaching an icon to a picture. All you need is a 'Project'-

JARGON BUSTING • JARGON BUSTING

Bitplane/bitmap – a bitplane is an area of memory where every binary bit corresponds to a pixel on the screen. One bitplane represents a monochrome image, several can be overlayed (a bitmap) to represent a colour image.

Compugraphic fonts – a Compugraphic font represents the shape of each character within the font as a mathematical equation of the outline. Consequently, as the magnitude of the character is varied in printing, no information is lost and the result always looks smooth.

Digitiser – a device which takes the input from a source such as a video camera and converts it to digital information for computer manipulation.

Printer driver – a program that sits inbetween any applications program producing output and the printer. It converts any codes describing text and graphics format into a form suitable for a specific printer.

PICTURE POSER

I recently bought a set of picture disks form PD Soft. The problem is that I cannot get them to load into my paint packages. I've tried loading them into *DPaint 2, DPaint 3* and even *DPaint 4* but to no avail. I returned them to PD Soft but the company checked them out and returned them to me with a note informing me that there is absolutely nothing wrong with the disks. I've even asked a couple of friends to try the disks for themselves, but they reported the same difficulties. What's wrong?

F Helcoop
Hedge End
Southampton

First things first – do the pictures display OK when you boot from the PD disks in question? If they do, then the reason why they won't load is that they are saved in a special file format which is not compatible with the IFF file format used by 99% of Amiga graphics software. My guess is that they are saved in RAW format, the most common non-IFF image format used on the PD circuit. The only way to get a RAW image to load into a program like *DPaint* is to convert it to IFF first using an image processing program like PIXmate. Failing that, use a screen grabbing utility like *PicSaver* to 'grab' the image into an IFF file whilst it is being displayed. *PicSaver* is available within the Fish collection of disks. ***JH***

type icon such as those attached to files saved out by any program that saves out external files. Just copy a project icon across into the same directory as your text file and then enter the CLI (or use something like *SID*) to rename the icon file so that it is attached to the icon. Say, for example, you had a text file called 'Contents.doc'. You would therefore then have to rename the icon file to 'Contents.doc.info'.

To make the icon access *PPMore* when it is doubled clicked on, copy *PPMore* into your 'C' directory first and then click once on the icon in question and select 'Info' (or 'Information...' for 2.0 users). A window will then pop up showing you all sorts of useful information about the text file that the icon is attached to. Somewhere within this window you'll find a string gadget that holds the file's 'Default Tool'. Just change this to read 'c:PPMore,' select 'Save' and you're done. ***JH***

WHICH DIGITISER?



I am a very keen photographer and I do a bit of freelancing, so my Amiga is already in use as a filing system for work I have supplied to photo libraries and magazines.

Some publishers, particularly in America, like to have a 'flyer' on their files showing the kind of work different photographers do and it occurred to me that the ideal system to produce one would be to use a program such as *ProWrite, PenPal* or some other DTP software to combine text and graphics together.

So I require some advice about digitisers – so that I can capture my photographs via my Sony TR55 camcorder and tripod. I would like to digitise in colour and monochrome and it looks like I have a choice of three digitisers available within my budget: Vidi-Amiga from Rombo; Digi-View Gold from NewTek; and the Datel Digitiser II system.

I would like to keep the amount of reconnecting to a minimum, as the way we have our Amiga set up makes access to the back of the computer difficult, to say the least. The side expansion slot is, however, easily accessible.

I wrote to Datel for information, but have received no reply, even though I sent an SAE. I have information from your review in *Amiga Shopper* on the Rombo digitiser, but I have no information on Digi-View.

Which system do you think would be my best buy, linking ease of assembly, use, and high quality results?

Paul Broadbent
Scunthorpe

Reading between the lines, I'll assume from your letter that you're talking about an Amiga 500 here, though you forgot to mention it.

Like you, I too have no knowledge of the Datel grabber beyond what I have read in the advertising. I plan to change this as soon as possible, but for now I'll have to admit that all I know about it is based upon what I've read.

I take it that you will be primarily interested in getting the highest quality you can to incorporate into your 'fliers', so I would recommend first of all that you consider digitisers which are capable of capturing images in hi-resolution (640 x 512 minimum), as these will produce higher quality prints. This rules out the Datel system, capable of only 320 x 256 max (ie lo-res), though as it is the only one which fits your expansion port you may want to take it simply for this reason, though this defeats the object of your question.

You've already got my opinion of the Rombo system, so all I have to do is tell you a little about NewTek's Digi-View. Like Vidi-Amiga, Digi-View uses the parallel port at the rear of your computer so the only way to avoid constant swapping around is to buy a parallel port sharer – a box which allows you to select between two (or more) parallel devices attached to it, for example your printer and your digitiser. As you require colour digitising from your colour video camera you'll also need a colour splitter to provide the correct feeds for the digitiser. You can use any suitable colour splitter with Digi-View. Like the Rombo system, the Digi-View digitiser will provide all the functions you require, so whilst Digi-View is *my* personal choice, I wouldn't like to force your hand further. Why not buy British? ***GW***

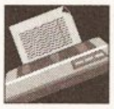
WORKBENCH GREYS

a) I have a program in my startup-sequence called *RecoverChipMem* and although this works, it gives me a Workbench screen in two colours! The only way I have discovered to get the Workbench back to four colours is by loading and saving *Kindwords* – is there an easier way?
b) I am hoping to upgrade my system to Workbench 2 and my hard drive is backed up using *Byte 'n' Back 3.1*. How do I get the information back after I have upgraded to Workbench 2?
c) If I do upgrade will my Supra 500RX be compatible with the new system?

G Scott
Bognor Regis

a) I have not come across *RecoverChipMem* but it seems obvious that it nicks a "bitplane" (about 16K) from the Workbench screen. Two bitplanes give a four colour display; one bitplane gives two colours. *RecoverChipMem* isn't recovering anything – it's just stealing the memory from Workbench and giving it back to the system. Workbench 2 allows you to customise the number of colours on the Workbench display from two to 16 – so you choose how much Chip memory is used.
b) I don't know much about *Byte 'n' Back* – in fact, last I heard it was no longer available. Restoring your hard drive from a 1.3 backup would be a *very bad move* as it might easily overwrite the new system software. The solution is to copy all your files to floppy disk using either *Byte 'n' Back*, Workbench or AmigaDOS; re-install your applications from their original disks; then re-install just your own files.
c) Yes. It's an Autoconfig™ memory expansion and will work with all Amiga A500 machines – no matter which ROM is fitted. This, by the way, is the safest way to fit any type of expansion memory for future compatibility. ***MS***

MOVE OVER DARLING



I recently bought a Canon BJ-10e printer, and as I am using it mainly for A4 poster work using *PageSetter* I am delighted. However I kept hold of my Star LC10 as the amount of draft copies I run off would make the BJ costly to run.

Herein lies the problem. When I use *Wordworth 1.1* the Star LC10 prints OK, as defined on the page layout with the left and right margins as specified, but when I change to the BJ-10e (yes, I do change the printer driver as well) the whole page is moved to the right slightly on the printout. I can get things right if I readjust the margins in *Wordworth*, but I'd rather not do this.

What am I doing wrong?

Dominic Thurmer

You're not doing anything wrong. In order not to spray any ink into the workings of the printer, the BJ-10e imposes its own slight left-hand and right-hand margins. Can't remember the actual measurements, but it's something like a quarter of an inch – look it up in the manual, it'll probably be in the section which deals with the printer's specifications.

So, the left-hand margin you specify in *Wordworth* gets added to the left-hand margin imposed by the BJ-10e? The only way to put it right is to do what you have already done, reduce the *Wordworth* left-hand margin.

The Star LC10 is an impact dot-matrix printer that puts marks on the page by striking pins against an inked ribbon, so there's no danger of gumming up the works with wet ink and it can consequently print all the way to the edges of the paper. ***JW***

THE MAC LADS

I know that MessyDOS allows the Amiga to read files to be read from PC disks, but is it possible to read files from Mac disks? I have access to a Mac at work and it would be very

continued on page 52

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handy to be able to continue with my projects at home.

Secondly, what about doing a feature on monitors? I keep on promising myself that I'll buy one one day but I'm confused about the different types available. Are TV monitors as good as 'real' monitors? Is the Phillips CM8833 as good as the Commodore 1084SD or should I go for something like the Philips 3332 15" FST TV monitor which Evesham Micros is always advertising?

(Wild) Bill Clinton
Tooting
London

Before we go any further, it's worth checking whether the Apple Macintosh which you have access to has a high density drive built into it. If it does, then you'll be able to read and write to PC-format disks on the Mac using the Apple File Exchange program bundled with the Mac. These disks can then be brought home and accessed using *MessyDOS*.

If your Macintosh at work doesn't have a high density drive, then there are two products which will allow you to read and write to Mac disks on your Amiga – Central Coast's *Mac2DOS* and BlitSoft's *Sybil*. *Mac2DOS* is a bit expensive especially when you consider that you need a Mac external drive to use it, but *Sybil* uses the standard Amiga drives and is considerably cheaper (£90). *Mac2DOS* is handled in this country by HB Marketing (☎ 0753 686000) and *Sybil* lives at BlitSoft (☎ 0908 666265).

TV monitors give a considerably better display than a standard television, but they're still not quite up to scratch when compared with a good monitor. If you'd also like an extra television though, they're a good bet. On the subject of the Phillips and Commodore monitors, they're internally one and the same. Commodore doesn't actually make its own monitors – indeed, about the only thing that Commodore produces are the little badges that stick on the front! If you have to choose between then, just go for the cheapest. ***JH***

Because of the width of the columns in *Amiga Shopper*, we occasionally have to break listings across two or more lines. Where this has occurred, and you should enter two or more lines without a [Return] between them, we have used the following symbol: ↲

JARGON BUSTING • JARGON BUSTING

Assembler – a program which converts an assembly language program written in words (well, almost) into the machine code numbers that the Amiga's 68000 processor understands. Writing programs in assembly language ensures that the best possible speed and memory efficiency is gained from the machine.

Assembly language – the programming language which is native to a particular processor. Assembly language is written as a series of short words known as mnemonics – these are converted directly into numbers for direct processing by the computer.

Genlock – a way of slaving one video source (eg Amiga) to another (eg video tape) in order to synchronise their signals to allow stable wipes, mixes and other effects including overlay between the two sources.

MessyDOS – a program which enables the Amiga to read and write to IBM PC format floppy disks. This does not mean that it can run PC programs, but simple text files can be transferred and used without major problems.

Modulator – a device which combines the output signal from a video source with a high frequency signal for further transmission. The video source is 'modulated' with a 'carrier signal'. This is required for TVs, which expect to receive their signals at very high frequencies.

ROCGEN TROUBLE



I've had several Commodore computers over the years, graduating from Vic20 to C64 and about 5 years ago to an Amiga 500. As I've become older (and wiser) I've shifted from playing games to using my computer for more serious tasks, such as desktop video. It's in connection with this that I need some advice.

I use an unexpanded Amiga 500, a RocGen Plus genlock, a video special effects processor and 2 VHS recorders, as well as a second disk drive and colour printer. I run the video and audio from the source VHS to the processor, then feed the video output to the genlock, and the combined Amiga/Video signal goes to the VHS recorder.

When I use the titling software I have my setup works fine, but if I try and run some PD software (eg demo disks) the video output starts to roll, as if the horizontal hold needs adjusting. The video signal looks OK, so it can't be a fault with the TV. Is it a fault with my genlock? I'm not using an external power supply for the genlock – could this be the problem?

Also, when I use the RGB Thru from the genlock to view the Amiga output, with a composite video signal simultaneously connected to the genlock, the RGB Thru output turns black and white. If the video signal is removed the RGB signal returns to colour. This is a pain as it is hard to produce graphics in black and white. Is this normal?

Do you know of any device (other than a video recorder) which can convert audio and video signals to RF output? The reason I ask is that I use my Philips CM8833 MkII monitor for viewing the Amiga output, a 14" colour monitor to view the final output via the video and I have another 14" TV that only has an RF input which I would like to use to monitor the output from the effects processor – which only has video and audio outputs.

My final question concerns digitising. Could you recommend a good video grabber which could grab frames from my video decks? They both have perfect freeze frame facility, so that's no problem. Moneywise, I am willing to spend enough to get good results. I know that I will have to expand my machine to use most of these, but I don't want to do that until I know how much memory I will need. If the grabber works with a video camera this would be even better.

Darrell Symons
Newbury
Berks

The timing problem that you are experiencing is more than likely *not* caused by a fault in your genlock, or the lack of an external power supply. It is probably caused by the demo program itself, which, in simple terms, is often breaking a few rules in order to produce graphic effects which wouldn't ordinarily be possible. I know that Bullfrog's game *Populous* also causes such rolling effects, as do some disk copier programs. I'm afraid there's nothing you can do about this except bypass your genlock.

This loss of colour from the RGB pass-through of the genlock when you have a composite signal connected doesn't sound normal to me. As the object of a genlock is to add graphics to video then it would seem most odd that you have problems when you actually put a video signal through one. I didn't experience this problem when I reviewed the RocGen Plus some issues back. Are you sure that your video input to the genlock is OK? If it has no colour signal (ie is black and white) or the colour information is lower than normal, then this might be causing the problem. Otherwise I think your genlock may need adjusting and you should contact your supplier.

To convert separate composite video and audio signals to the RF required by an ordinary TV a device called a modulator is used, which is how VCRs and some computers produce their RF outputs. In order to fulfil your requirements you will have to find a modulator which can handle both audio and video inputs. I've looked through several electronic component suppliers' catalogues and the only one I've found is a video-only unit in the Radio Spares (RS) catalogue (Part No UM1233).

My best advice would be that you go to a specialist electronic components shop and see if they happen to have any modulators in stock, check through any books of circuits they may have, and seek their advice. You might also consider pulling a modulator from a redundant VCR and refitting it to suit.

My personal choice of low-cost digitiser is still NewTek's Digi-View, which may be a little slow by modern standards but it produces very good results. You'll also require a colour splitter to split the colour video signal into the three colour components required by the digitiser. This applies to any digitiser which can produce colour output from colour input. You may prefer to buy a package such as Rombo's Vidi-Amiga combined with Vidi-RGB.

Both digitisers should cost less than £150 (including colour splitter), will work with your Amiga 500, and should give good results. By the way, any digitiser which accepts composite video input will work with cameras, VCRs, laser disks, or any other composite video sources.

Finally, I would recommend that you add as much memory as you can afford, but at least 2Mb will be a great help if you want to do hi-res digitising or animation. ***GW***

ASSEMBLED FORCES



I am hoping soon to learn assembly language programming on my A500. I have the following questions:

a) I've noticed that there are a

continued on page 54

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number of different books available ranging from 68000 programming to system programming on the Amiga. Such books are expensive and I do not wish to pay out money for a book which is not going to cover my needs. Could you recommend one which gives details of the Amiga chips?
b) I've not had any success in getting such books from my local library. Are there any computer clubs which provide book loan facilities?
c) What is the best PD assembler and how does it compare to the *Devpac* series?
d) Does the new *Devpac 3* assembler actually create faster machine code than the *Devpac 2* or is it just the layout/speed of the assembler which has been improved?
e) In your opinion, is *Devpac 3* worth the extra expense over the *Devpac 2* assembler?

D Millwood
Wimborne
Dorset

JARGON BUSTING • JARGON BUSTING

COBOL – Common Business Orientated Language, used extensively on large computers in the commercial sector. It is also used, though to a lesser extent, on the IBM PC and compatibles.

Escape codes – a means of sending a printer formatting instructions embedded in an ASCII text file. An escape code consists of the ASCII code for the escape character itself, followed by other characters which describe the formatting operation (bold, italics, underline and so forth) required.

Font – the group of letters, numbers and special characters that comprise variation of typeface, eg: 12pt Times, 12pt Times Bold, 12pt Times Italic. Sometimes (mistakenly) used in desktop publishing to refer to a type family.

Library – the Amiga has many special features, and programs are already present in the operating system to make use of these features. These programs, or library functions, may (and should) be used by applications programs, obviating the need for each programmer to write a similar set of routines.

MIDI – Musical Instrument Digital Interface is a standard devised by electronic instrument manufacturers, allowing a number of synthesisers to be controlled by a single keyboard or sequencer.

None of the Amiga-specific assembly language books seem to help much with the general problems of learning assembly language. Similarly, none of the books which deal with the 68000 instruction set and writing 68000 code will mention Amiga-specific issues. The bottom line is that you'll need more than one book. For general programming advice I'd recommend a book by Kane, Hawkins and Leventhal called *68000 Assembly Language Programming* (published by McGraw Hill). For the Amiga specific chip material the Abacus Amiga Systems *Programmer's Guide* contains a lot of low-level programming info but, since it rather assumes that the reader is already 68K literate, I suspect that from a tutorial viewpoint you might find it disappointing.

To be honest there isn't a single system book to fit the bill but there is no doubt that your biggest problem in programming the Amiga using assembler is going to be in coming to terms with system related issues (use of libraries and so forth). There's no way around it – you will need as much system info as you can lay your hands on and this will eventually mean the Addison Wesley ROM Kernel Manuals, possibly the Bantam AmigaDOS manual and a host of other publications as well.

I've not heard of any clubs which publicise the fact that they provide Amiga technical book loan facilities but some do offer discounts on purchases. My advice would be to get a general 68K book first and spend some time with that (it will give you some insight into programming the 68000 processor itself). Also hunt through old Amiga magazines for examples of assembler code to get the feel for what has to be done. When you need answers to specific points write to us at *Amiga Shopper* and we'll be only too happy to help.

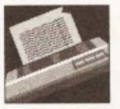
The most well known 68000 public domain assembler is called *A68k*. It was written by Charlie Gibbs and you can find it on a great many public domain disks. *A68k* is an excellent piece of software but being a CLI/Shell based assembler it is not particularly user-friendly. Another disadvantage is that you will not get the official Commodore '.i' include files with any of the *A68k* public domain disks – you'll need to buy these separately (they are available from Commodore).

Assemblers produce code which, in terms of the machine instructions, is to a large extent identical to the assembly language instructions that are contained in your program. Most assemblers can make minor changes to certain addressing modes but in the main you will not, in terms of final program performance, find any noticeable difference between any of the Amiga assemblers (public domain or otherwise). *Devpac 3* may carry out extra instruction replacement optimisation steps but for all intents and purposes you will not find any real differences in the execution times of a *Devpac 3* assembled program over a *Devpac 2* assembled program.

The speed of the assembly process, ie the time taken for the assembler to convert your program to the equivalent machine instructions, is very dependent on the assembler being used. In fact, in the old days, when assemblers tended to have to read and write temporary files to disk during the assembly process, assembly times were often a significant factor in the overall edit-assemble-debug development cycle. Things have improved with 16-bit machines and on the Amiga even the 512K machine user will be able to assemble most of their programs using the ramdisk (ramdisk read/write operations are of course much faster).

As far as *Devpac* goes here is the bottom line: *Devpac 2* was fine but *Devpac 3* is better (see the *Devpac 3* review in *AS* 12). No-one pays me to say kind words about any software (and none of us at *Amiga Shopper* would be interested in providing those wishy-washy 'always brilliant' reviews anyway). The fact of the matter is simple... *Devpac 3* is well worth the extra cash – it has a much improved user-interface, a much improved editor and all sorts of other goodies, such as allowing the use of pre-assembled header files to further improve the speed of assembly. One other advantage of the *Devpac* path is that it comes with those all-important system include files. ***PAO***

STAR WON'T PERFORM



Could you please give me a simple sequence to set up and use downloaded fonts on my Star LC200 printer, and also how to use the escape codes given on the manual?

I recently bought LC10/200 Fonts by Jeff Tullin (LPD22 from the AMOS library) and this is what prompts the above questions. Having loaded the program and set up the printer, the program would appear to download the selected font. But when I try to print using a word processor such as *TextEngine V3* I cannot get any output.

GM Lloyd
Dolgellau, Gwynedd

TextEngine is a very simple shareware text editor, you can't really call it a word processor, and I don't know a lot about it. But my guess is that just before *TextEngine* starts to print what you have typed or loaded into it, it sends a printer reset code in order to reset things like page size, margins, text styles etc.

This is normally a sensible thing for a word processor to do, but in your case it means that the font you just downloaded gets wiped from the printer's memory. The solution is to prevent the word processor from sending the reset code, but as this is not an option provided with *TextEngine*, you're stuck.

Of the commercial word processors available, I know that *Protext* has a specific configuration option that before printing either sends the reset code or not, depending on whether you want it to. As for PD and shareware text editors, the only way to find out is to experiment. I suggest that the latest version of *TextPlus* would be a good place to start; this is the only Amiga shareware 'word processor' which comes close to living up to its name.

To use *all* the escape codes given in your printer manual you either need to write a program to send codes directly to the printer (PAR:, not PRT:), or you need a word processor which allows you to send printer-specific control codes direct to the printer.

There is one thing you can do that will solve both your problems – buy *Protext*. ***JW***

COBOL QUERY



a) I am taking a course at my local college in COBOL programming and I would therefore like to know whether there is a COBOL compiler available for the Amiga.
b) I use music software on both systems and I'd like to transfer MIDI files from the PC to my Amiga. I know that I can do this through MIDI, but it would be far easier if I could transfer the files straight from disk. I already own *MessyDOS* but the files are incompatible.
c) Is it possible to connect the PC and the Amiga together?

RC.Spence
Billingham, Cleveland

continued on page 62

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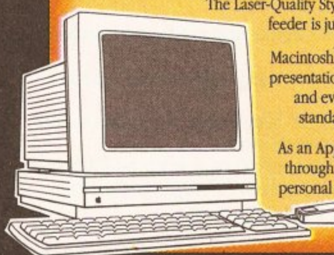
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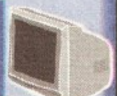
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- MOUSE MAT
- 3 TAILORED DUST COVERS

ADD A CUMANA CAX 354 SECOND DRIVE FOR JUST £50 TO HELP RUN THOSE BUSINESS PACKS MORE EFFICIENTLY

WE MEAN BUSINESS AT A GREAT PACKAGE PRICE OF JUST...

£899.95 Including VAT

HARWOODS LEARN & PLAY

EDUCATION

PRIMARY & JUNIOR PACK A

Get your children off to the right computing start with this software learn and play Compendium 6 pack...

KIDS TYPE, WEATHER WATCHER, CALENDAR QUIZ, WORDS & NUMBERS, GAME SET & MATCH, WHAT IS IT ?- WHERE IS IT?
Active, enquiring young minds will love the fun of these six entertaining but educational titles. Your children probably won't even realise that their "lessons" have begun!!! .

HOMEBASE
Ideal home storage system. Keep household lists, student records etc. Easy to use "push button" controls.

PRIMARY MATHS COURSE
Around 24 modules in this course from 3 yrs old right up to secondary level. Follows N.C.

READING & WRITING COURSE
24 module course. Teaching from the computer and books. For early starters & the dyslexic.

LESSON A — EDUCATION — A — PACK A

A GREAT EDUCTIONAL PACK FOR YOUR CHILDREN AT A FRACTION OF THE NORMAL COST

£69.95 Including VAT

HARWOODS LEARN & PLAY

EDUCATION

GCSE/'O' LEVEL PACK B

GCSE examination level studies on your Amiga computer that's fun!

MICRO ENGLISH, MICRO FRENCH AND MICRO MATHS
A set of three complete self-tuition courses to GCSE level which can also be used for revision work. All programs adhere to the National Curriculum and were designed and tested in schools by professional teachers. Micro French includes "real speech" to help your accent!

PEN PAL- Graphical Word Processor
A fantastic word processor with all the tools you'll need to create effective written work. Ideal for home work, projects etc. or for the families letters. Text wraps automatically around graphics, even as you type! Includes a built-in database and Forms Manager.

HOMEBASE
Homebase is the ideal information storage program for things like household lists, student notes, and children's educational projects. Inc. clearly labelled "push button" controls and clear comprehensive reference manuals.

LESSON B — EDUCATION — B — PACK B

A GREAT EDUCTIONAL PACK FOR YOUR CHILDREN AT A FRACTION OF THE NORMAL COST

£89.95 Including VAT

VISA — Access — Switch — Connect

Enquiries & Order Line:
0773 836781

Finance Facilities Available*
Please phone us for information and your personal application pack.

GORDON HARWOOD HARWOOD HARWOOD Computers
ALFRETON DERBYSHIRE

The Closer you look, The Better we look.

Finance terms are available (subject to status) for most products; please see our ordering panel at the end of this advert for full details

SOUND AND VISION

Words and Pictures

CDTV



IMAGINE, IF YOU CAN, THE CONCEPT OF A NEW, MORE POWERFUL AMIGA...

...WITH 1 MEGABYTE OF MEMORY, AND A COMPACT DISK DRIVE OF ALMOST INFINITE SIZE. A DISK DRIVE SO VAST, IT CAN STORE HUNDREDS OF MILLIONS OF DIGITS OF DATA. THIS DATA COULD BE, SPEECH, ANIMATED PICTURES, DIGITISED STEREO SOUND, COMPUTER IMAGES OR WHOLE ENCYCLOPAEDIAS.... AND MORE.

IMAGINE THIS, AND YOU CAN START TO GRASP THE CONCEPT OF CDTV.

THE INTEGRAL COMPACT DISK DRIVE, IS THE KEY TO THE POWER OF CDTV. ITS STORAGE CAPACITY IS EQUIVALENT TO AROUND A QUARTER OF A MILLION FULL PAGES OF TEXT. THIS WHEN INTEGRATED WITH THE 1 MB OF INTERNAL AMIGA CIRCUITRY, CREATES A SYSTEM, WHICH FROM A CD DISK, CAN GIVE YOU ACCESS TO AN UNIMAGINABLE SPECTRUM OF REAL WORLD IMAGES, NEVER SEEN COMBINED BEFORE. THESE VIVID IMAGES, WITH WORDS AND SOUNDS, GIVE YOU A WHOLE NEW DIMENSION IN HOME EDUCATION, ENTERTAINMENT & INFORMATION TECHNOLOGY. AND... DON'T FORGET, THAT CDTV CAN PLAY IN SUPERB QUALITY, ANY NORMAL AUDIO MUSIC CD, AND IT CAN ALSO PLAY THE NEW CD+G DISKS, WHICH GIVE DIGITAL SOUND AND ON SCREEN GRAPHICS.

ON CD DISKS NOW AVAILABLE, THERE ARE EDUCATIONAL PACKAGES, ENCYCLOPAEDIAS PACKED WITH REFERENCE INFORMATION, STUNNING GAMES, MUSIC SYSTEMS AND MANY OTHER NEW AND VARIED SUBJECTS, INCLUDING WHOLE WORLD ATLASES OR EVEN THE COMPLETE WORKS OF SHAKESPEARE, EACH ON ONE CD DISK!!! **CDTV - NOTHING LESS THAN REVOLUTIONARY**

FREE CDTV STARTER PACK!!!

WHEN YOU CHOOSE YOUR CDTV FROM GORDON HARWOOD, NOT ONLY DO YOU GET OUR LEGENDARY SERVICE, BUT WE GIVE YOU A CDTV STARTER PACK, TO GET YOU EXPLORING YOUR NEW WORLD - STRAIGHTAWAY. THIS INCLUDES A SUPERB SELECTION OF CD DISK TITLES INCLUDING THE WELCOME TUTORIAL & HUTCHINSONS ENCYCLOPAEDIA, PLUS ... FIVE GAMES, SHERLOCK HOLMES & THE HOUND OF THE BASKERVILLES, SIM CITY, CHAOS IN ANDROMEDA, A TOWN WITH NO NAME, AND THE ACCLAIMED LEMMINGS, WORTH IN TOTAL ALMOST £200.00. IN ADDITION IS THE INFRARED REMOTE CONTROLLER, AND ALL THE HARDWARE NEEDED TO GET YOU CONNECTED.

ALL THIS FOR JUST £499.95

CDTV IS THE SAME SIZE AND STYLE AS MOST VIDEO RECORDERS, SO IT CAN SIT UNOBTRUSIVELY ABOVE OR BELOW YOUR HOME TV AND/OR HI-FI. AND WITH ITS INFRARED REMOTE CONTROLLER, IT CAN BE OPERATED FROM YOUR ARMCHAIR. BUT PERHAPS MOST IMPORTANTLY, IF YOU ARE A COMPUTER ENTHUSIAST, REMEMBER THAT INSIDE EVERY CDTV, IS AN AMIGA, JUST WAITING TO BE USED. SO LATER ON, YOU'LL BE ABLE TO BUY THE OPTIONAL KEYBOARD AND DISK DRIVE, TO GET INTO THE WORLD OF AMIGA COMPUTING. PRINTERS, DIGITISERS, GENLOCKS AND OTHER ACCESSORIES,CAN ALL BE CONNECTED TO GIVE ACCESS TO MANY OTHER EXCITING FACILITIES, AND ALSO MANY OF THE EXISTING SOFTWARE PACKAGES AVAILABLE FOR THE AMIGA COMPUTER. NEVER BEFORE HAS THERE BEEN SO MUCH POTENTIAL FROM ONE NEW STUNNING SYSTEM, PACKED WITH **TODAYS TECHNOLOGY.!**

CALL IN AND SEE US FOR YOUR PERSONAL DEMONSTRATION, OR PHONE US FOR YOUR FREE DETAILED CDTV INFORMATION PACK.

CDTV ACCESSORIES

Please call for latest availability.

CD 1220 KEYBOARD	AN 89 KEY QWERTY KEYBOARD	£49.95
CD 1252 MOUSE	INFRARED MOUSE WITH BATTERY SAVER.	£49.95
CD 1200 TRACKBALL	INFRARED TRACKBALL, WITH THE OPTION OF DIRECT CONNECTION TO EXTEND BATTERY LIFE. DUPLICATES FUNCTIONS OF 2 BUTTON MOUSE & INCLUDES TWO 9 PIN PORTS FOR STD. JOYSTICKS	£79.95
CD 1400 CADDY	FOR HOLDING CD WITHIN DRIVE	£9.95
CD 1401 MEMORY CARD	PERSONAL RAM CARD CONTAINING 64K OF MEMORY FOR STORING DATA OR AS A BOOKMARK FACILITY WITHIN CDTV	£79.95
CD 1405 MEMORY CARD	A LARGER PERSONAL RAM CARD CONTAINING 512K OF MEMORY FOR STORING DATA OR AS A BOOKMARK FACILITY WITHIN CDTV	£249.95
CBM FLOPPY DRIVE	3.5" FLOPPY DRIVE WITH 880K CAPACITY. MATCHING BLACK FINISH . SUPPLIED WITH AMIGA WORKBENCH DISKS/MANUALS etc.	£99.95
CD 1301 GENLOCK	PAL BASED VIDEO INTERFACE CARD FOR SUPERIMPOSING CDTV IMAGES OVER A VIDEO SIGNAL PROVIDED BY ANY STANDARD VIDEO SOURCE	£149.95
ROCLITE 3.5" DRIVE	CDTV COMPATIBLE AND STYLED IN MATCHING BLACK.	£69.95

Many Amiga Accessories & Peripherals (e.g. Printers, Disk Drives, Software etc.) are compatible with CDTV. Please phone us for compatability information.

HARWOODS AMIGA

PRO-GEN

NEW LOWER PRICE



PROFESSIONAL QUALITY GENLOCK FOR COMPUTER AND VIDEO MIXING, AT A DOWN TO EARTH PRICE!!!

Please note the above photograph shows Spectracolor which has now been replaced by Photon Paint 2.0

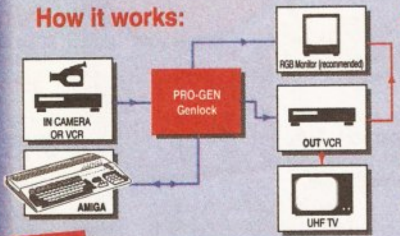
PRO-GEN Amiga Genlock

The Pro-gen AMIGA Genlock allows you to mix your Amiga display with any PAL video signal whether it is from a VCR, Laserdisk player or a Camcorder. In fact any item of video equipment which outputs a PAL composite video signal.Combined with the Amiga computer the Pro-Gen gives you the facilities of a special effects & video titling suite. Take your own films & give them a professional look by OVERLAYING TITLES or by SUPER IMPOSING YOUR OWN GRAPHICS created in packages like Photon Paint 2.0 or Deluxe Paint. Pro-Gen is supplied with micro illusions superb Photon Paint 2.0 package.

FREE Photon Paint 2.0 Software

A powerful Lo-and-Hi resolution hold and modify (HAM) paint program, with overscan (NTSC/PAL) and special effects for your Amiga Computer including all the following... **Contour Mapping:** drapes a brush over a 3D "landscape". Pixel intensity values decide the peaks and valleys, while a specially developed ray-tracing algorithm maps the image precisely. **Surface Mapping:** around 3D objects, both geometric and free hand drawn. **Luminance:** sets the light source and intensity. **Shadowing**: automatically with control of size and offset. **Brush Control:** twist, tilt, resize, flip, rotate, bend, adjustable transparency, stretch etc etc. PLUS LOTS MORE! A great program allowing use of 4096 colours. Choice of horiz/vert page print, negatives, anti-aliasing, dithered print, adjustable brihgtness etc.

How it works:



STOP PRESS

PRO-GEN... NOW INCLUDES A VERY VERSATILE MULTI COMPONENT VIDEO TO GENLOCK CONNECTING CABLE KIT. THIS ALLOWS PRO-GEN TO BE USED STRAIGHTAWAY WITH MOST POPULAR VIDEO EQUIPMENT, WITHOUT THE NEED TO HUNT DOWN THE CORRECT CONNECTING CABLES. THIS KIT CAN ALSO BE USED TO CONNECT IN OTHER WAYS... eg. VCR TO VCR etc.

A KIT TO START YOU OFF RIGHT FROM THE MOMENT YOU OPEN THE BOX!!!

NEW LOWER PRICE

PRO-GEN with Photon Paint 2.0 ONLY £99.95

Mode Switch-box for Genlocks

Features Include
- Compatible With The Pro-Gen And Rendale 8802
- Supplied With Genlock Extender Cable Worth £9.95
- Switch-box Switches Between Foreground, Background, Video And Computer Modes.

£29.95

Finance terms are available (subject to status) for most products, please see our ordering panel at the end of this advert for full details

AMIGA DRIVES & MEMORY

Cumana CAX354 3.5" External 2nd Disk Drive.

- ☆ Features Include
- ☆ Long connecting cable
- ☆ 1Mb, (880K Formatted) Capacity
- ☆ Enable/Disable Switch,
- ☆ Throughport
- ☆ Access Light
- ☆ Compatible with Amiga500/1000 1500/2000/3000 and CDTV

NOW SUPPLIED WITH A FREE 3.5" Disk Head Cleaner to maintain your new drive in 'tip-top' condition.

£57.95



GVP 52-420Mb HARD DISK DRIVES WITH MEMORY EXPANSIONS OF UP TO 8Mb.

- ☆ Capacities of 52 to420Mb
- ☆ Connects to sidecar bus on L/H side of A500/A500 Plus
- ☆ Autoboots with Kickstart 1.3/2.0, boot enable/disable switch
- ☆ Sockets for up to 8 Mb of RAM
- ☆ SCSI Port allows up to 7 other devices to be connected
- ☆ Supplied with easy to use software
- ☆ 2 Year Warranty ☆ Dedicated PSU
- ☆ Mini slot for future expansion
- ☆ PC-AT Emulator planned to be available for 1992

GVP AMIGA A500 HARD DRIVES

RAM SIZE	CAPACITY 52Mb.	120Mb.	240Mb.
0Mb.	£349.95	£519.95	£729.95
2Mb.	£419.95	£589.95	£799.95
4Mb.	£489.95	£659.95	£869.95
8Mb.	£629.95	£799.95	£999.95

GVP AMIGA 1500/2000 HARD DRIVES

RAM SIZE	CAPACITY 52Mb.	120Mb.	240Mb.	420Mb.
0Mb.	£289.95	£409.95	£639.95	£1169.95
2Mb.	£359.95	£479.95	£709.95	£1239.95
4Mb.	£429.95	£549.95	£779.95	£1309.95
8Mb.	£559.95	£679.95	£899.95	£1429.95

CALL FOR MEMORY UPGRADE PRICES IF YOU ALREADY ARE A GVP OWNER!

EDUCATION SOFTWARE

DON'T JUST PLAY GAMES WHEN YOU CAN LEARN WITH YOUR AMIGA TOO!

MICRO MATHS - 24 easy to use programs for GCSE ('O' Level) revision or self tuition **£18.95**

MEGA MATHS - A 9 level step by step tuition course. For mature beginners, 'A' Level studies & Micro Maths users **£20.95**

MICRO FRENCH - GCSE French tuition or revision course. Covers both spoken & written French **£18.95**

MICRO ENGLISH - Complete self-tuition programe to GCSE level. **£18.95**

PRIMARY MATHS - Ages 3 to 12, Complete 24 Prog. Course. **£18.95**

SPELL BOOK - Ages 4 to 6, Developed with the help of a Primary School Head Teacher to aid spelling skills. **£17.95**

HOMEBASE - Home storage prog., ideal for those household lists, childrens educational projects, student notes etc. Easy to use "Push Button" controls and a extensive reference manual. **£19.95**

COMPENDIUM SIX PACK- 6 Great Educational Progs. for children aged 4-12years of age. Each is designed to keep your childs interest whilst they learn. **KIDS TYPE** - Large characters & colurful graphics helps creation of stories. **WEATHER WATCHER** - Collect & analyse data using graphs etc. even animate your own weather map! **CALENDAR QUIZ** - Quiz based learning of time related events. **WORDS AND NUMBERS** - Put words & scentences in the correct order or group numbers. **GAME, SET & MATCH** - Early learning of shapes colours, numbers, coins, sequences and including a "reaction timer". **WHAT IS IT? WHERE IS IT?** - Learn names & locations of British counties. **£29.95**

HARWOODS AMIGA 1Mb PRO-RAM PLUS

ADD MORE POWER TO YOUR AMIGA 500 PLUS WITH A FULL 1Mb. MEMORY UPGRADE!!!

- ☆ 1Mb. RAM expansion for the Amiga 500 Plus
- ☆ Gives a total of 2Mb. of RAM
- ☆ Easily fitted without any dismantling in the trapdoor expansion slot underneath Amiga. DOESN'T invalidate your warranty!
- ☆ Low power consumption ☆ 2 Yr Guarantee!

A GREAT NEW OFFER FROM HARWOODS

Only... **£44.95**

0.5 Mb PRO-RAM

- ☆ Compatible with Amiga A500 and 500 Plus
- ☆ Gives A500 a total of 1Mb Memory + Clock
- ☆ Gives 500 Plus a total of 1.5Mb Memory

Only... **£29.95**

AMIGA SOFTWARE

Music-X: The ultimate software for professional MIDI sequencing. The software includes a configurable librarian and a synthesiser patch editor. All you need to recreate a song can be recalled from one performance file including sequences, MIDI routing, sync setup, keyboard maps & synthesiser or drum machine patch libraries. **NEW LOW PRICES - £49.95 or just £69.95 with midi-interface!**

MIDI INTERFACE (5 Port): In, Out, Through plus 2 switchable thru'/out. Inc. 2 cables. **£24.95**

AMOS: AMOS allows you to access the power of the Amiga with ease. 500 different commands make AMOS a sophisticated development language. The AMOS animation language allows you to create complex animation sequences. 300 page manual and over 80 example programs **£49.95**

Amos Add on Modules: (BOTH require Amos prog.)
Amos Compiler £29.95 Amos 3D £34.95

BUY ALL THREE AMOS PROGRAMS FOR JUST **£89.95**

SuperBase 4: Most powerful database available for the Amiga.Combines the ease of use of Super-Base 2 with a versatile programming language so that you can tailor your data to your own specific needs for club/business/library records etc. **£229.95**

Lattice C: An ideal tool for the C programmer whether experienced or a novice. The best way to create applications for the Amiga.Fully supports Motorola chipset. Nearly 300 functions optimised to help the user write the tightest possible code. Includes screen editor. Most Amiga C books are based around lattice. (Requires either 2 floppy drives OR a hard disk drive) **£199.95**

Deluxe Paint IV: Latest version of the Amigas first, and still the best, paint and animation package, now including HAM mode. (1 Mb. minimum memory or more recommended) **£79.95**

Vidi, The Complete Colour Solution: Vidi with RGB Splitter, Frame Grabber & Digitiser. Grabs moving colour video into 16 grey scale frames (up to 16 frames in 1Mb. Amiga) and digitises from still colour video source in up to 4096 colours in less than 1 second! Requires home VCR or video camera for grabbing. Requires video camera or VCR with perfect pause for digitising. Now comes with Photon Paint 2.0 ABSOLUTELY FREE OF CHARGE!!! **£149.95**

STEREOMASTER: High quality "stereo" sampler (best for sampling instruments etc.) **£39.95**

THE ABOVE IS JUST A SMALL SAMPLE FROM OUR EXTENSIVE RANGE OF THOUSANDS OF SERIOUS, EDUCATION AND RECREATION TITLES.WE CAN'T LIST THEM ALL HERE SO PLEASE CALL US IF YOU CAN'T SEE THE PROGRAM YOU REQUIRE, IT'S PROBABLY IN STOCK!

Pen Pal V.1.3

WORD PROCESSOR/DATABASE
With Pen Pal you can mix text, 4096 colour graphics & data in ways no other w/p can! "It's handling of graphics is unsurpassed: Pen Pal is the only word processor I tested that will automatically wrap text round graphics..
Amiga World, July '90



£79.95
PEN PAL complete WITH 512K Amiga RAM Expansion ***only...£99.95!***

All our packs contain the new Amiga A500 Plus. (1.3 Amigas may still be available to special order, please enquire.)

Enquiries & Order Line: **0773 836781**

Finance Facilities Available*
Please phone us for information and your personal application pack.

GORDON HARWOOD HARWOOD HARWOOD Computers
ALFRETON DERBYSHIRE

The Closer you look, The Better we look.

*Finance terms are available (subject to status) for most products: please see our ordering panel at the end of this advert for full details

FREE... Fully Tailored Dust Cover with all Dot Matrix Printers

PRINTERS

NEW FREE ACCESSORIES

All printers in our range include a standard Centronics/Parallel Port for direct connection to Amiga, PC's, Atari ST's, Archimedes etc.

We supply a connection cable to YOUR computer plus a Quality Dust Cover with ALL Dot Matrix Printers — FREE FREE



When you are comparing our prices to others make sure that the same essential items are included eg. Printer Lead, Dust Cover, Postage and VAT etc.

GORDON HARWOOD PRINTER STARTER PACK
ALL our Dot Matrix Printers are supplied complete with...
- 200 Sheets of Continuous Printer Paper — FREE
- 100 Useful Self Adhesive Continuous Labels — FREE
- Amiga Printer Drivers Disk — FREE

CITIZEN 120D+ 9 PIN MONO - Up to 120/25 cps — £149.95
- Very reliable low cost printer with interchangable interfaces for Centronics/RS232/serial type (C64 etc.)
- Full 2 Year manufacturers warranty

NEW FASTER STAR LC20 9 PIN MONO - Up to 150/38 cps — £159.95
Replacement for our most popular Mono Dot-Matrix at a super low price
- Multiple font options easily accessible from front panel
- Excellent paper handling facilities
- Simultaneous, continuous and single sheet stationery
- 240 x 240 dpi Graphics

STAR LC200 9 PIN COLOUR PRINTER - 185/40 cps — £209.95
This is the one in our packs!
- 80 Column Dot Matrix
- 240 dpi - 9 Pin COLOUR
- 16K Buffer, 8 Resident Fonts
- Push/pull tractor & rear/bottom feeds
- Reverse paper feeds
- Micro paper feed, Max. paper width 11.7"
- Supplied with colour & mono ribbons
- Paper park with auto single sheet loading
- Programmable from front panel.
- 12 month warranty

CITIZEN SWIFT 9 PIN COLOUR - 160/40cps — £214.95
New super high spec 9Pin colour printer
- 8K Buffer 4 Fonts
- Push and pull tractor built-in
- Feed for labels/multi part stationery
- 240 x 240 dpi Colour Graphics
- Best text quality in our 9Pin range
- 2 Year Citizen warranty

STAR SJ48 INKJET PRINTER — £249.95
New super high quality bubble ink jet printer
- 64 Nozzle ink jet
- Emulates Epson LQ and IBM Proprinter for full compatibility
- Complete with AC adaptor
- Large 28K Buffer
- 360 x 360 dpi near laser print quality
- Optional Ni-Cad battery for mains free operation

STAR LC24/200 24 PIN MONO - 220/55 cps — £249.95
Mono version of LC24/200 Colour, same spec except for a smaller 7K buffer

STAR LC24/200 24 PIN COLOUR - 220/55 cps — £299.95
Colour version of the LC24-200 Mono.
- 80 Column Dot Matrix
- 360 dpi - 24 Pin MONO
- 30K Buffer (expandable)
- 10 Resident Fonts
- Front Panel Pitch Selection
- Push/pull tractor & rear/bottom feeds
- Reverse paper feed
- Paper park with auto single sheet loading
- Micro paper feed, Max. paper width 11.7"
- Supplied with mono ribbon
- Faster than the old LC24-10
- Extra font cartridges available
- Program from front panel, No DIP switches
- 12 month warranty

NEW 24 Pin CITIZEN 224 COLOUR - 160/53 cps — £254.95
Brand New, lowest cost colour 24 Pin printer, anywhere!
- 80 Column Dot Matrix with 4 Fonts
- 360 dpi - 24 Pin COLOUR
- 8K Buffer expandable to 32K
- Easy to use front panel controls
- Push & pull tractor feeds
- Complete paper parking facilities.
- Supplied with mono & colour ribbons
- Full 2 Year Citizen Warranty

NEW 24 Pin CITIZEN SWIFT 24E COLOUR - 180/60 cps — £319.95
Brand New, superb specification colour 24 Pin printer.
- 80 Column Dot Matrix with 7 Fonts
- 360 dpi - 24 Pin COLOUR
- 8K Buffer expandable to 32K
- Easy to use LCD panel controls
- Push/pull & bottom tractor feeds
- Complete paper parking facilities.
- Supplied with mono & colour ribbons
- Full 2 Year Citizen Warranty

NEW FASTER STAR XB 24 PIN COLOUR RANGE XB24-200 & XB24-250 - 275/80 cps — £399.95 24-200 Colour — Wide Carriage £499.95 24-250 Colour
These NEW top of the range Stars replace the XB24/10 & XB24/15, & offer the best possible quality dot matrix printing
- Exceptional print quality
- 4 x 48Pin super letter quality fonts
- 14 x 24Pin near letter quality fonts
- Buffer: 29K(XB24/200) & 76K (XB 24/250)
- 360 x 360 dpi Colour Graphics
- 12mths on-site warranty (UK Mainland)

HEWLETT PACKARD PAINTJET COLOUR A4 INKJET — £579.95
Our best quality full colour printer at a realistic price
- Parallel/Centronics or Serial RS232 I/F (specify with order, MAC option available)
- For presentation graphics/DTP, CAD and technical/scientific applications
- A full page of colour graphics in 4 minutes (typical)
- Non impact printing, virtually silent, 43dba
- Will print transparencies
- 12 Months on-site warranty (UK Mainland)

STARSCRIPT - 4ppm POSTSCRIPT COMPATIBLE LASER — £1099.95
A4 Laser Printer, will connect to PC, Amiga, Atari ST, Macintosh etc.
- 300 DPI, 2Mb. Upgradable to 5Mb.
- Emulations inc: HP Series II, Epson EX800, IBM Proprinter & Diablo 630
- Complete with "Starscript" (Stars postscript language emulation)
- Serial and Parallel Interfaces
- 12month on site warranty (UK Mainland)
- 49 quality fonts built-in
- Appletalk for connection to Macintosh
- Every desktop publishers dream

SEE OUR LIST OF ACCESSORIES FOR BOTH STAR AND CITIZEN PRINTERS, ALL AT COMPETITIVE PRICES!

All the characters Per Second speeds quoted above are Draft/LQ at 10cpi

PRINTER ACCESSORIES

CITIZEN PRINTER ACCESSORIES:

Citizen 120D+ Sheet Feeder	£69.95
Citizen 120D+ Parallel Interface	£49.95
Citizen 120D+ CBM C64 Serial Interface	£49.95
Citizen 124D 32K Buffer	£13.95
Citizen 124D Semi-Auto SheetFeeder	£39.95
Citizen 124D Automatic Sheet Feeder	£79.95
Citizen 124D Printer Stand	£24.95
Citizen Swift 9 Semi-Auto SheetFeeder	£39.95
Citizen Swift 9 Automatic Sheet Feeder	£79.95
Citizen Swift 9 Printer Stand	£24.95
Citizen Swift 9X Printer Stand	£34.95
Citizen Swift 9X Automatic Sheet Feeder	£139.95
Citizen Swift 24 32K Printer Buffer	£13.95
Citizen Swift 24 Semi-Auto Sheet Feeder	£39.95
Citizen Swift 24 Automatic Sheet Feeder	£79.95
Citizen Swift 24 Printer Stand	£24.95
Citizen Swift 24X Auto Sheet Feeder	£139.95
Citizen Swift 24X Printer Stand	£34.95

HEWLETT PACKARD PAINTJET PRINTER ACCESSORIES:

Hewlett Packard PaintJet	
Black Ink cartridge	£25.95
Colour Ink Cartridge	£31.49
Single Sheet Printer Paper	£17.95
Z-Fold Printer Paper	£15.95
Transparency Paper: Pack of 50 Sheets	£52.95

STAR PRINTER ACCESSORIES:

Star LC-20 Mono Printer	
Automatic SheetFeeder	£74.95
Star LC24-10 Mono Printer	
32K Buffer £67.95	£67.95
Automatic SheetFeeder	£74.95
Star LC-200 Colour Printer	
Automatic SheetFeeder	£74.95
Star LC 24-200 Mono/Colour Printers	
32K Printer Buffer	£34.95
Automatic SheetFeeder	£74.95
Star SJ48 Printer	
Automatic Sheet Feeder	£54.95
Ni-Cad Battery	£39.95
Star XB 24-200 Colour Printer	
Pull Tractor	£34.95
Font Cartridges - Styles To Be Announced	£29.95
128K Centronics Printer Buffer	£89.95
Automatic SheetFeeder	£114.95
Dual Bin SheetFeeder	£429.95
Star XB 24-250 Colour Printer	
Pull Tractor	£34.95
Font Cartridges - Styles To Be Announced	£29.95
128K Centronics Printer Buffer	£89.95
Automatic SheetFeeder	£174.95
Dual Bin SheetFeeder	£469.95



GENUINE CITIZEN & STAR REPLACEMENT PRINTER RIBBONS

PRINTER	PRINTER TYPE	BLACK RIBBON	BLACK RIBBON 'SIX PACK'	COLOUR RIBBON	COLOUR RIBBON 'SIX PACK'
CITIZEN 120D+	BLACK ONLY	£4.95	£24.95	N/A	N/A
CITIZEN 124	BLACK ONLY	£4.95	£24.95	N/A	N/A
CITIZEN SWIFT 9	BLACK/COLOUR	£4.95	£24.95	£16.95	£99.95
SWIFT 24/24E/224	BLACK/COLOUR	£4.95	£24.95	£16.95	£99.95
STAR LC10*/20☆	BLACK/COLOUR	£4.50*☆	£24.95*☆	£6.90*	£36.50*
STAR LC200	BLACK/COLOUR	£6.95 ZX9	£36.95 ZX9	£12.95 ZX9CL	£69.95 ZX9CL
STAR LC24/200	BLACK/COLOUR	£8.95 Z24	£49.95 Z24	£14.95 X24CL	£74.95 X24CL
STAR XB RANGE	BLACK/COLOUR	£8.95 Z24	£49.95 Z24	£14.95 X24CL	£74.95 X24CL
STAR SJ48 INK CARTRIDGE	BLACK ONLY	Also compatible with Apple Stylewriter and Cannon BJ10E Bubblejet			£15.95ea.

BOOK SHOP

FOR BEGINNERS & EXPERTS ALIKE



WE ALWAYS CARRY LARGE STOCKS OF THE FULL RANGE OF ABACUS & OTHER BOOKS...Phone us for details!

AMIGA FOR BEGINNERS - VOL. 1 ABACUS BOOKS, — £12.95
From unpacking your Amiga to creating your own icons, includes first use of basic and extras disk. NEW revised version covering workbench 1.3 and 2

AMIGA BASIC INSIDE AND OUT - VOL 2 ABACUS BOOKS, — £18.95
Definitive step by step guide to programming Amiga's in basic.

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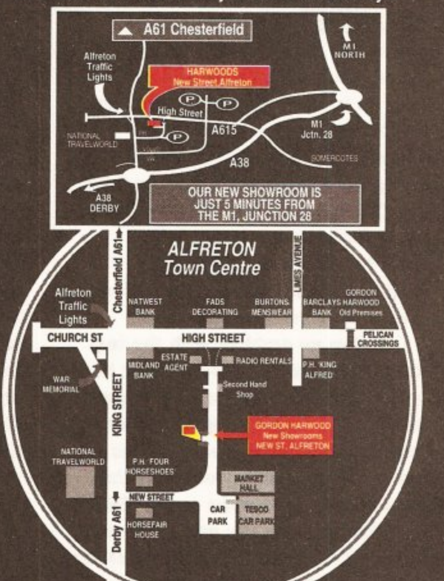
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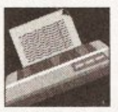
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continued from page 54

a) A COBOL compiler on the Amiga? I'm afraid not! Your best bet is to use an Amiga PC Emulator and run the PC COBOL compiler on that.
b) Raw SysEx files should transfer and work directly from PC disk. Sequencer files will definitely not work, simply because MIDI sequencers save files in their own proprietry file format. However, most sequencers support a standardised file format called MFF (MIDI file format) which can be used to convert sequences produced on one sequencer to work on another. Programs such as *Trax* and *Music-X* support MFF, so it's only a matter of checking that your PC sequencer also supports it (I'd be very surprised if it doesn't!).
c) This depends on your requirements. If you just want to transfer files between them, then a null modem cable and some Comms software will do the job (although you'd probably be better off using *MessyDOS*). If you want to do anything more complex, then the answer to your question is no. ***JH***

FEED FOR THOUGHT



I am in despair. I have devoured every article in every publication that I could find dealing with the setting up of printers. But I am still at a loss as to the cause of my problem which, as you can see from the example I've sent, is rather unsightly in graphics printouts from my Commodore MPS1550C colour 9-pin dot matrix printer.

I have tried all the density settings in Preferences and different paper combinations to no avail.

I have no problem with the text output, but any graphics output has unsightly lines on it caused by rows of dots overlapping slightly. I have come to the conclusion that this is due to an inaccuracy of either the paper feed mechanism or the 'ESC 3 n' command in the printer driver.

I am using an Epson JX-80 driver which according to the manual is the correct one for the MPS1550C in Epson emulation mode. I have tried using an IBM graphics printer driver in the IBM emulation mode with the same results.

I have a copy of the PD printer driver generator program *PrtDrvGen*, and did attempt to alter the 'ESC 3 n' command, however as *PrtDrvGen* does not decode the graphics routines of printer drivers I soon had a printer driver that printed garbage incredibly slowly.

Help?

NJ Milnes
Brownley Green
Manchester

Your logic is perfect, and you have correctly diagnosed that the banding on your graphics dumps is caused by inaccurate line feeds, so reading all those articles has done some good.

I notice, however, that you didn't take my advice in the article I wrote about printers for *Amiga Shopper* a couple of months back and wasted some time mucking about with *PrtDrvGen*, an outdated and seriously difficult to use piece of software written to work with 1.2 printer drivers (which have only four graphics densities), which it doesn't appear to always decode and subsequently save properly.

It could be the printer driver that's causing the banding, but it's more likely to be an inherent inaccuracy in the printer's feed mechanism. If you want to try another driver, the MPS1550C should work with the Star9Plus driver on Jamdisk 5 (from *JAM* on 0895 274449).

But I think a better solution is to buy *TurboPrint Professional* which, apart from dramatically enhancing your output, will also allow you to increase the line feeds to help reduce the banding. *TurboPrint Professional* comes with a driver that says it is for Epson EX, FX and LX emulations, but this should work for JX emulation as well. ***JW***

ALL TO NO AVAIL

I have a 68010-based Amiga with 4.5Mb RAM, and will shortly be fitting another 2Mb in my A590. When I use AVAIL the largest available block of Fast RAM is about 2Mb. I have tried MergeMem, FastMemFirst and AdRAM programs in the startup-sequence, but I keep getting the same result. Is there any way to link the blocks together to make one large one? Will it make any difference when I fit the RAM to the A590 or do I need a different type of memory.

Tony Leach
St Neots

There's nothing wrong with your machine – it just works like that! Your 4.5 Mb is divided like this:

- 512K Chip
- 512K Fast (in the trapdoor)
- 3.5Mb Fast from the ICD AdRAM

Fast and Chip are not usually connected in one block because they fulfil different functions. This leaves 4Mb and of that 512K is fitted to the trapdoor and this can only be accessed as Fast or Chip dependent on which Agnus you have. That leaves 3.5Mb for the ICD unit. Since this isn't Autoconfig compatible, it just crowbars itself somewhere in the memory map – probably addresses as one 1.5Mb chunk plus 2Mb.

Even assuming you could link the ICD and Trapdoor, that gives two 2Mb chunks which accounts for the inability to get large segments – although I have yet to come across a program that requires huge (2Mb) chunks of contiguous memory. Most programs allocate lots of much smaller ones – it rather depends on the application. The only way to get a massive block of Fast RAM is to replace the whole thing with a custom made job – such as a Supra or Cortex 8Mb. ***MS***

QUESTIONS, QUESTIONS

a) What books do you recommend which concentrate on Workbench and AmigaDOS 2? I am particularly interested in its hidden features such as the Fast File System, the Boot menu, ARexx etc.
b) What are the Bootmenu's advanced options for?
c) What does the Fast File system do and how does it work? Does the Workbench 'Format Disk' option use the standard file system or the fast file system by default?
d) I recently bought a PD program called 'ARQ – The Requester Improver' which allows you to attach sound samples to gadgets. Which format should these samples be in?
e) Under AmigaDOS 1.3, which file contains the mouse pointer definitions? I have quite a few PD disks and I'd like to change the shape of the mouse pointer, but very few of them have the Preferences program on them.
f) How do I use the AmigaDOS commands Ask, Skip, Quit, Lab etc within an *IconX* script file?
g) Which tooltypes does *IconX* support?
h) How do I use ARexx supplied with Workbench 2.0?
i) I recently came across a program called *NoPalReset* on an *Amiga Format* coverdisk. What does it do?
j) Is it possible to copy the Workbench programs 'DiskCopy' and 'Format' to the RAM disk so that I do not have to insert the Workbench each time I wish to format/copy a disk?
k) What can the tool types entry of a volume be used for?

Ross McLesd
Wirral
Merseyside

a) Try Bruce Smith Books' *Mastering AmigaDOS* (volumes 1 & 2) written by our very own Mark Smiddy. Both volumes are available from good book retailers everywhere.
b) The bootmenu's advanced options page isn't actually that advanced at all. All it allows you to do is to enable or disable any floppies or hard disks that may be installed.
c) The Fast File System is a more advanced release of the Amiga file system that works faster and is more efficient than the file system used by previous OS releases. It's built into ROM under 2.0 and therefore its use is completely transparent.
d) I haven't actually used that particular piece of PD software, but I'm quite sure that it will accept samples in standard IFF 8SVX format. Just about every Amiga sample editor outputs files in this format, so you can't go far wrong.
e) Under 1.3, the mouse pointer image and other parameters are held within a file called 'system-configuration' which is held within the DEVS: directory of your Workbench disk. This file also contains other information about your system including the screen colours, which printer should be used (although you'll still need to copy across a couple of extra files to access the printer) and a whole lot more besides.
f) I'd need the next six pages to adequately explain how to use all the commands that you mentioned. However, these commands are explained in great depth within the books recommended in answer a).
g) *IconX* has two tool types – DELAY and WINDOW. Adding delay to *IconX* allows you to keep the window open after a script has been executed and is entered in the format DELAY=nnnn (nnnn is a number expressed in 1/50ths of a second). The window tooltype allows you to specify the size of the *IconX* window. The format is 'WINDOW=CON:<Horizontal Pos of right edge>/<Vertical Pos>/<Width>/<Height>/<Window Title>.
h) ARexx is an interprocess communications language enabling you to write scripts that control other applications. ARexx is virtually a programming language in its own right, so it would be almost impossible to cover it in any great detail within these pages. Stay tuned though for features on ARexx in future issues of *Amiga Shopper*!
i) *NoPalReset* is a PD program which resets a PAL Amiga if it accidentally boots up in NTSC mode.
j) If you're running them from the CLI, all you have to do is to add the command 'Path RAM: Add' to your startup-sequence and they will be used instead of their disk-based equivalents. It's not possible to redirect AmigaDOS to the RAM disk when you try to load them from the Workbench pull down menus though.
k) There's a simple answer to that question – volumes don't have tool types! ***JH***

continued on page 66

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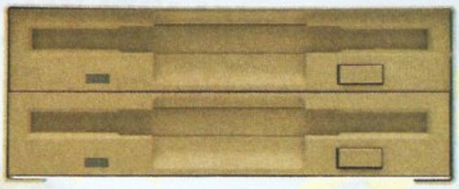
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FutureWorld computers

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CITIZEN 224 DRIVER



I have a Citizen 224 colour printer and while I am pleased with its own fonts I am disappointed that I have so far been unable to print from either *Pen Pal* or *Deluxe Paint II* without getting a large number of errors.

In both cases I am using Epson printer drivers, but they don't seem to work. Could you please advise me as to which driver I should use, where I can get it, and tell me what the dip switch settings should be?

Graeme Kneeshaw
Darlington
Co Durham

When used as a monochrome printer, the Citizen 224 emulates the Epson LQ-500 and LQ-850, and so will work with the EpsonQ printer driver on the Extras disk in devs/printers.

But the LQ-500 and LQ-850 are both monochrome printers, so when you buy the Citizen 224's colour option (as you have) it has to emulate something else in order to print colours. Thanks to a very helpful young lady called Trish at Citizen I can tell you that for colour printing the Citizen 224 emulates an Epson LQ-2500.

EpsonQ won't work too well here because this driver was written before the LQ-2500 was invented. I can't give you a definite answer, but there are two drivers which should work with any printer that emulates an LQ-2500 – EpsonQPlus and Star24Plus, available on Jamdisks from JAM on 0895 274449.

Trish tells me that the Citizen 224's Epson emulation is 100 per cent compatible, so perhaps the EpsonQPlus driver is the one to try first. For the dip switch setting you will need to consult your manual. ***JW***

HOT AND BOTHERED



I have a 9Mb A1500 and I'd like to know is there anything I can do about the fan noise?

Daniel McGilvray
Lanarkshire

Wear ear muffs perhaps? All that memory will dissipate a lot of heat and if something doesn't cool it down, it will start to go wrong. I have heard of some people removing the safety grid (it adds to the noise) but I don't recommend that. Actually, you'll get used to it after a while. Alternatively, try playing some loud music – Guns and Roses should do... ***MS***

JARGON BUSTING • JARGON BUSTING

ASCII – American Standard Code for Information Interchange. It is the data storage method commonly used when we type text files and enables data to be exchanged between different programs and even different computers.

Basic – Beginners' All-purpose Symbolic Instruction Code is a high-level programming language, much favoured by micro-computer users. It combines a fair amount of power with ease-of-use.

Modem – device which converts computer signals into a suitable format for transmission along a phone line. Likewise, it will convert incoming signals back into a form the computer can recognise.

PAL – one of the main TV colour coding system (with the exception of France's SECAM system), which is in use around the world and was developed in Britain. PAL refers to Phase Alteration Line.

Startup-sequence – a program which is executed every time the Amiga is switched on and after every reset. It sets up the system so that it is usable from Workbench, and may be customised by those who have unusual hard or software requirements.

LISTING BASIC



Will you please advise me how to get an Amiga Basic program to output to a printer. Also how can I get a print-out of the program listing so that I can see the whole program when I debug it. I have *KindWords 2.0*, *Text-Plus* and *Text-Engine* but the Basic program format will not print out.

Ron Boxer
Fleet
Hants

The commands which I think you are interested in are the line printer equivalents corresponding to Basic's PRINT and LIST statements. They are called LPRINT and LLIST and are documented, along with the LPRINT USING command (which like PRINT USING has a more user-controllable output format) in the Amiga Basic Reference manual. LLIST can be used from the Basic command window. Used alone the whole program will be printed but for printing selected portions of a program you may include line numbers.For example, the statement LLIST 200 – 500 will print just program lines 200 to 500 inclusive.

Amiga Basic normally saves its programs using a tokenised form which uses less space and is quicker to load and save. This is why your word processor program cannot make sense of the program files! If you want to be able to read such programs into the word processor it is necessary to save them in what is called ASCII format (ie as an untokenised straight ASCII character file). This cannot be done from the Amiga Basic menu but it's easy enough to do from the command window using the SAVE command. Just specify the device:filepath/filename you wish to save the program under (in double quotes) but follow it with a comma and the letter A like this:

```
SAVE "df1:myprogram",A
```

You'll then be able to read the program into your word-processor without encountering any problems. ***PAO***

A TOUCH OF ELAN



My friend and I both have Amiga 1500 computers and live about three miles apart. We both have modems. How can we communicate with each other?

The manual for *Elan Performer 1.05* is a bit hazy about making an auto-playing disk. It mentions changing the Startup-Sequence. Can you help me in this respect?

Norman Waring
Banbury
Oxon

Your Comms question is simple enough to answer. Excuse me if I'm stating the obvious, but get yourselves some communications software, such as the excellent *NComm 1.92* (which is shareware), install a copy on each of your Amigas, connect your modems to your computers and telephone lines and then arrange between the two of you which protocol you are going to use. This depends largely upon the speed and type of your modems. For instance, you'll probably want to communicate at the highest speed common to both your modems, such as 1200, 2400 etc and would also generally have settings of 8NF1 which correspond with Data Length (8), Parity (None), Duplex (Full) and Stop Bits (1). It's obviously a little more complicated than this, and you can run into lots of problems, but you'll get there. By the way, if you become regular Comms freaks, I'd recommend you subscribe to Mercury and save a few bob. Watch out for handy tips in the Comms column in *Amiga Shopper* too.

I have a solution for your *Elan Performer* problem, though I've based it on using *Elan Performer 2*, rather than the version you have. There shouldn't be any problems though. Here's how I did it:

Step One: copy your *Elan Performer* disk, and then remove everything except Player, Player.info, and the S, C, L and DEVS directories and their contents. You can also remove all the Keymaps from Devs/Keymaps (but leave usa0), and the printer drivers can go too.

Step Two: copy as many of your presentation images as will fit onto this new disk.

Step Three: run *Elan Performer* and use the new disk to provide the images for your presentation. Set up your sequence in the usual way, then save the environment (ENV) to the new disk. I called my test file TEST (because I was being really original!).

Step Four: using a text editor such as Ed, TxEd, MEMACS or whatever you prefer, load the startup-sequence file from the S: directory of the new disk and add:

```
Player TEST
```

above the line which says "LoadWb". Save the modified file.

Step Five: double click on the disk Icon of your new disk, click once on the ENV icon (which should say TEST under it) and the select Info from the Workbench menu list. A window will appear on the screen. Ensure that the text:

```
/Player
```

appears in the Default Tool line. If not, edit it to be correct. You need to do this to set the path for the Tool (in this case the Player program) which the ENV (performance) file runs from.

Step Six: you should now have a disk which will boot and then automatically play back your creation. Note that the initial loading of pictures will take a little while, and then the display will speed up as it pulls back images from RAM: the next time round.

It occurs to me that if you wish to do multiple disk presentations you should be able to modify the above by having extra disks with images on them which the boot disk will call for

and pull in as required. Ensure that these disks have different names or there will be confusion. Have fun! ***GW***

WRITE RIGHT-OFF

I have recently bought a second hand Amiga but I have since discovered a problem with my new machine. Whenever I try to format or copy a write-enabled disk from the Workbench, a requester appears informing me that the disk is write protected.

My son has tried them on his Amiga where they format and copy OK which leads me to believe that there is a problem with my machine. The moulded power supply plug that connects to the back of the machine seems to have a loose connection because the machine switches itself on and off if you tap the connector. Could this also be causing the drive problems?

J Barker
Parson Cross
Sheffield

It sounds to me as if the drive inside your machine has developed a fault. My advice to you would be to take the machine along to a Commodore-approved repair centre and ask them to sort out the problem. As for the power supply problem, you'd be well advised to get this sorted out as it could cause serious (and rather expensive) damage to your Amiga. ***JH***

HARD DRIVE HASSLE

About 18 months ago I bought an A590 in Germany. Since day one it has had an annoying problem in that it refuses to boot from cold. I get errors from both hard drive partitions (which I have repeatedly reformatted to no avail) and sometimes even from floppy drives too. I discovered that if I leave the machine on for about 15-20 minutes and perform a warm re-boot it works perfectly. Could this be a virus? Also, can you tell me how to use the Symbol font in *Wordworth*?

Guillaume Thibaudeau
Newcastle-Upon-Tyne

Oh dear, what a sorry state that seems to be in. In a case such as this you should have sent the A590 back to the supplier – or at least to FMG – as soon as you noticed something was amiss. It does sound like a heating problem – possibly a dry joint in the controller board or even a dodgy resistor pack.

It might be something in the hard drive mechanism, but this fault appears to affect the main board too – and that sounds like a controller fault; it is almost certainly not a virus. This sort of thing is notoriously difficult to trace and the only solution would be to get it serviced by someone specialising in CBM kit such as FMG.

You should be able to access *Wordworth*'s Symbol font and print it on an LC-10 by printing in graphics (as opposed to NLQ) mode. See, it's not all bad news. ***MS***

DCTV V AVIDEO24

I need some advice! I already have quite a comprehensive Amiga 500 setup – with an A590/2Mb RAM and an SSL B5000 68030 accelerator with 4Mb of 32-bit RAM. I've been having great fun making animations with *Imagine 2.0*!

Now I'm getting ready to buy a video enhancer (DCTV or AVideo24) and a decent video recorder and need a little help. I only want to dump my images to tape, and I won't be messing about with fades, wipes or titles. Does this mean that I only need to buy a PAL encoder (can you recommend one?) or do I still need a genlock?

In order to make seamless transitions in my video productions I think that I need a video recorder with flying erase heads and an insert edit feature. Am I right? Can you recommend such a machine for under £500?

I'm prepared to assemble my anims on to tape manually if I have to, but will a utility like *ShowMaker* function OK with the output just going to one video recorder? Your review didn't make it clear whether you could use just one VCR.

If I recorded an image from DCTV on to tape and an AVideo24 image on to tape, which would be clearer? If the quality is roughly the same when transferred to tape I would be better off buying the DCTV, wouldn't I? Because if I did I would get a 'free' digitiser and (presumably) the DCTV would animate quicker than the AVideo?

I am also thinking of buying the DKB MegaChip board to increase my Chip RAM to 2Mb from 512K. Will plugging the board in enable 2Mb of RAM immediately, or do I still need to do some soldering? Will my B5000 board clash with the MegaChip?

And, *finally*, do you *have* to have two monitors to use DCTV – I wouldn't like to have to buy yet another TV!

Mark Platts
Sheffield

There's a lot to deal with here so I'll do my best to help you, though I think you might already be confused about one or two things.

Let's start with AVideo24 v DCTV. The straight answer to this question is specifically "I can't tell you". I was hoping to be able to, but I just haven't had a chance to test the video out of an Avideo24 yet, though I would *expect* the quality to be superior to DCTV's composite output if a good RGB encoder or genlock was used. Since DCTV only puts out composite there is no need for an encoder or genlock, though I'm not too enamoured with DCTV's output quality myself. However, since these answers will be submitted a week before my video column words, stay tuned to the Video channel for any late news.

On the single monitor for DCTV question, the answer is that you can get away with using one monitor, so long as it has both RGB and composite inputs and is switchable between them. My old Commodore 1081 works a treat.

Turning to the VCR query, are you sure you don't mean single frame recording, rather than insert editing? Because if you are planning to use AVideo24 to display the 24-bit frames from *Imagine*, then you'll have to record them one at a time to tape to produce your animation, as AVideo24 doesn't play back 24-bit animation (what can on the Amiga?) This will require a VCR which costs several times more than the £500 you have, and you'll also require a single frame controller of some kind if you wish to automate the process, further adding to the expense.

If you simply plan on playing DCTV animations to tape then an insert capable VCR should be just the ticket, as you say. I would recommend you check out a magazine such as *What Video*, where you'll find detailed reviews of many VCRs, and recommendations of best buys. There are several models, including the Ferguson FV47S (S-VHS) at £550, or the JVC HR-D960 at £570, which might just fall within your range at street prices. Don't forget that even with an accelerator you may not get full speed playback with even DCTV ANIM files.

Unless some new device drivers have been added to *ShowMaker* there is only one VCR that it will control, and this is not available in the UK. You might consider *Video Director* also by Gold Disk, though again I haven't had chance to review it yet, so I won't comment on its suitability. There are other systems, such as EMR's *VideoPilot*, or Syntronix' *EditMan*, though these are for editing from VCR to VCR, not Amiga to VCR. I would think that you could arrange your editing by hand, if you were careful.

Whether or not extra work is required after fitting the MegaChip expansion depends on the revision board of your Amiga. The more modern Amigas don't require any messing about; but earlier models require a track to be cut and a small amount of soldering. Full details are given in the MegaChip manual. ***GW***

MIDDLE OF THE ROAD

My problem is in trying to print in A4 landscape from any documents written in Gold Disk's *Write*, DTP'd in *PageSetter* and output to a Star LC24-200 mono printer.

Despite all my efforts I cannot overcome the left-hand margin being some 2-3 inches in from the edge of the page.

Can you solve this one for me?

Alan Sorah
Simmondley Village
Derbyshire

Although you sent me a printout, Alan, you haven't really given me many clues as to what you are doing. For instance it would help if I knew the page layout you are using within *PageSetter.*

When you say you are 'printing landscape' with *PageSetter* I assume you mean that you have a sideways A4 page on screen and you are putting the paper into the LC24-200 sideways? In fact you must be doing this because *PageSetter* doesn't have a landscape output option.

The problem is that although you can feed a piece of paper into the LC24-200 sideways, the printer wasn't designed with this purpose in mind so the print head can't actually get to the far left and the far right of the paper. What you end up with is an 8 inch wide printout smack in the centre of the page.

The solution is to buy some DTP software that has a landscape output option, so you can feed the paper into the printer normally and the page will get rotated by 90 degrees before printing. *PageStream* or *Professional Page* (2.1 and above) will do what you want. ***JW***

PEN FRIEND

Some 3 or 4 months ago I purchased a copy of *Pen Pal*. As is my usual practice, I made three back-up copies of the program and then tucked the master disk safely away.

Unfortunately my computer recently developed a fault (it refused to duplicate disks) and so I therefore sent the machine off to be repaired. When it returned however, both the *Pen Pal* backups and even the master disks refused to load due to read/write errors. Can you tell what's happening? Have I lost *Pen Pal* for good?

MJCoote
Hawkers Lane
Wells

There are two possible reasons why this might be happening.

You state that your Amiga is unable to read the backups of *Pen Pal*, but are you encountering similar problems with other disks? If you aren't, then I think you may have a virus problem which could also account for the problems that you were having when you tried to duplicate a disk. The virus which I think your disks might have contracted is called the 'Lamer Exterminator'. It's a pretty weak virus which can be killed using any good virus killer so I would advise you to run all your disks through such a program before going any further.

If the virus killer fails to find a virus on any of your disks, then you could have a problem with the alignment of the heads within your Amiga's disk drive which was probably caused when the machine was sent back to your from the repair company.

If there is a fault with the hard disk's heads, I'd advise you to contact the company and explain. Technically it is its responsibility to sort the problem out. ***JH***

DO ME A FAVOUR!



I have a Hewlett-Packard LaserJet IIIP printer and a DeskJet 500 Colour. If have specific drivers for either I would be grateful for a copy. I enclose a blank disk and a stamped addressed envelope.

Nick Teasdale
Cookham Dean
Berkshire

Please. *Everyone*. Watch my lips. Do not send me, nor anyone else at *Amiga Shopper*, blank disks, stamped addressed envelopes, money, cheques, postal orders, gifts or offers of marriage in return for an Amiga printer driver. Not only do we not have the time to provide this service, but we don't even have the time to sort out and return your disks or money or whatever.

Right, Nick. JAM (0895 274449) has a 'better than nothing' DeskJet 500 Colour driver on its Jamdisk 8. Nothing for the LaserJet IIIP though. ***JW***

ALTERNATIVE SAMPLER



Is it possible to get a sound sampler that does not plug into the Amiga's parallel port or a device which will allow me to plug a printer and a sampler into the parallel port at once? I haven't actually bought a sampler yet so I'd appreciate it if you could also recommend a good sampler which will work with *MED* and Amos

Colin Mackay
Edinburgh

The US company Mimetics used to make a sampler that connected to the Amiga via the joystick port, but I'm not sure whether this is still in production. About the only other sampler available that doesn't connect to the parallel port is the *Pro Sampler Studio 2* from Datel Electronics. It costs £50 and connects to the Amiga via the bus connector on the left hand edge of the A500. I must admit that I wasn't too impressed by it, so you'd probably be better off buying a parallel port sharer like those marketed by Maplin Electronics.

Sampler wise, you won't go far wrong with either New Dimensions' *TechnoSound Turbo* or MicroDeal's new *Stereo Master* (reviewed in issue 10 of *Amiga Shopper*). Both are sub-£40, so they won't break the bank either! ***JH***

A BRACE OF SCARTS



I have an Amiga 500+ and I recently bought a Ferguson 41P3 fastext TV/ monitor. I am using an Amiga to Sony SCART cable but I have a problem in that the computer signal overrides the TV channels so that I cannot switch between channels unless I switch off the computer. It would appear that there is a fault in the lead or the TV socket.

Can you recommend a lead which would rectify this problem, or a company who could make one up for me? I can live with the setup if I have to, but it would be nice to be able to check the TV now and again without having to shut down the Amiga.

EG Berney
Peterborough, Cambs

I have a Gold Star CIT-4902 TV which has a SCART connector and I would like to use it with my Amiga 500, but I can't find a lead that will do this. I've tried both Sony and Philips' leads and, after showing the SCART connections from the manual to the bloke at the computer shop, I was given a lead that went from the SCART to the modulator video out – which gave poor results. Is there a lead for Gold Star TVs? I will make my own lead if I have to. Can you help?

Tim Hollins
Groby, Leicester

This SCART problem comes up month after month. It seems that it really is a non-standard standard. So each time I call Trilogic and ask if the company does this cable, or that cable, I am invariably told that it does. Now, I am obviously unable to personally vouch for this, but unless I hear from anyone to the contrary, I will continue to advise you to contact Trilogic on ☎ 0274 691115. Another company which specialises in leads of all descriptions, and in particular monitor leads, is Meedmore Distribution on ☎ 051 521 2202. ***GW***

DISK DAZE



I want to add a hard disk to my Amiga system, but if possible using an MFM or IDE PC hard disk. I know the Amiga usually uses SCSI or ST506 (whatever that is). I have heard that ICD does controllers for IDE but I have not been able to find out about them.

Later on, I'd like to add a Bridgeboard to my system but I'd like to know if there is a 386 version available, as I will prefer a faster machine for the MS-DOS programs I want to run.

Mark Northcott
Colchester

It seems you are confusing the drive formatting techniques with the interfaces. ST506, SCSI and IDE are forms of interface whereas MFM is a disk formatting and transfer protocol; the other versions you may see are GCR and RLL. Oh, I hate jargon…

The ST506 interface was used mainly in the PC-XT clones and it's a relatively slow 8-bit bus. IDE, employed in the PC-AT clones, is faster being 16-bit. SCSI is a smart interface which isn't restricted to hard disks – it can drive tape streamers, printers – you name it.

Speedwise, SCSI comes out about 20% slower than IDE – but a lot depends on the controller card.

The best IDE controller card I have seen is the RocHard although it only supports 1" high drives of certain makes.

RocHard II supports both SCSI and IDE; the original can be upgraded and interestingly can support IDE and SCSI at the same time. Dataflyer supports more manufacturers. Give Trilogic a ring on ☎ 0274 691115 for more information.

A 386SX-based Bridgeboard from Commodore is about to be released, look out for our review. ***MS***

TURBOPRINT DTP?



***Professional Page 2.1* uses the Workbench printer preferences, printer drivers and so on. Can it be made to use the *TurboPrint Professional* drivers and settings, and how is this done?**

The 'banding' I get from my printer is most annoying, will *TurboPrint Professional* help?

Dave Bush
London SE9

JARGON BUSTING • JARGON BUSTING

C – a compiled language designed primarily for systems programming. It was used to write much of the Amiga's operating system, and is used in the writing of many Amiga applications.

Emulator – a device, either hardware or software, that enables programs written for another machine to be used on the Amiga. The emulator makes the Amiga take on all (or most) of the characteristics of the foreign machine, and is transparent to the programs running under it.

Sample – a digital – computerised – representation of a sound. A sample can be sent through a digital to analogue converter (the Amiga has four of these) and be heard as sound. Changing the speed at which the sample is played back changes the frequency (or pitch) of the sound.

Sampler – a device which converts sounds into digitised samples.

SCSI – Small Computer Systems Interface is the most popular standard used for connecting hard drives, CD ROM drives and tape back-up units to computers. More common on the PC is the IDE standard, which is also used in the hard drives for the new A600.

Shell – a method of communicating with the Amiga's operating system via the keyboard rather than the more usual mouse and windows method of Workbench. The Shell is the interface which 'surrounds' the Kernel, the central part of the operating system. The terminology comes from Unix.

Yes, *Professional Page 2.1* will use most of *TurboPrint Professional*'s drivers and settings. Read the review starting on page 81 of issue 12 for full details, including which printers it supports.

You neglected to mention what printer you are using, so I can't tell you whether *TurboPrint Professional* comes with a driver for your printer or whether it'll help get rid of the banding. (Sorry, the crystal ball's in for a service today.) Tell you what I do know though, from the appearance of the printout you sent me it looks like you have been trying to make your ribbons last longer by spraying them with WD40. Be warned that you will damage your print head beyond repair by doing this.

There is some proper ink you can buy called Refresh if you want to re-ink your ribbons. Call Caspell Computers ☎ 0202 666155 and the people there will tell you all about it. ***JW***

VIDEO TITLING HELP

I have 2 Amigas (1.3 500 and 2.0 500+) and I have a few problems for you to solve. So here goes.

a) What do I need to do simple video titling? I have a Panasonic NV-333 video recorder, if that's of any help?

b) Is it possible to connect a camera to the NV-333 and display real-time images on a monitor?

c) Is it possible to write software to do video titling in C language, or would it be better to buy software to do this, if possible? I have security applications in mind.

d) I have the Technical Reference Manuals (blue covered 2nd editions) but I've heard that there is a new set out. Are they worth the money?

Russell Willis
County Down
N Ireland

Do you want to produce titles to *overlay* on to a video picture, or do you envisage titles which are simply edited *in between* video images? The reason I ask is to help you decide whether you need a genlock or not. To superimpose on to video you will probably require a genlock, which enables video to be input on one side and mixed graphics and video to be pushed out at the other, unless you have access to fairly sophisticated video equipment which can provide a similar effect.

You'll also need a video *source*, as well as a recorder, if you want to superimpose via a genlock. This could be from a camera, but it's more likely you'll want to use a VCR to play back pre-recorded material.

Then you'll require a program capable of actually producing the titles. Unless you are really keen to write your own software I really wouldn't bother, as there is a whole gamut of suitable programs already available, from public domain to professional quality, though of course you could program them in C if you really wanted to.

Your deciding factors will be what you require the software to do and how much you want to pay. You could use a paint program such as *DeluxePaint*, or go for programs such as *TVText*, *Home Titler*, *Big Alternative Scroller*, *Broadcast Titler*, *VideoLab*, *Pro Video Plus* or others.

You shouldn't have any problems displaying live images on your monitor if you have a suitable camera and VCR. If there is a video out connector on your camera, simply connect it to your VCR's video input, change its input selector from tuner to camera, set your monitor to its normal setting for playing videos, and you should be in business.

If you intend writing any sort of serious application to work under version 2 of the operating system, then yes, the latest editions of the technical reference manuals are a must. ***GW***

EMULATION SENSATION

Please could you tell me if it is possible to get a C64 emulator for the Amiga. I know that there is a hardware-based emulator available in the States, but I haven't heard of a UK distributor. Could you also tell me whether it is possible to use a C64 disk drive with the emulator. I already own a Cumana 5 1/4" drive for my Amiga. Can I use this instead?

John Gay
Southall
Middlesex

The Commodore C64 emulator to which you refer is available in this country through Entertainments International, but it is rather pricey at £99.

I think that your best bet would be to treat yourself to *A64*, a PD C64 emulator which will do just about everything that the commercial emulator will do, but it costs just £2 (the price of a disk!). The emulator is actually a shareware product and if you register your copy with the authors, they will send you an adaptor which will enable you to connect and use any standard C64 disk drive including both the 1541 and the 1571, the enhanced drive designed for the C128 (One of Commodore's greatest flops!). Unfortunately, neither emulator will support your Cumana drive, so you'll have to splash out for a C64 drive if you wish to use the emulator to its full potential. ***JH***

ASK SID!

Could you please explain how to install *SID 1.6* on to a hard disk so that it functions correctly. Could you also explain how to modify the StartUp-Sequence file so that the keymap for Great Britain is automatically installed. At the moment, I have to keep on clicking on the 'KeyMap' program in the Workbench System drawer to get it to install correctly.

Norman New
Surrey

To function correctly, two files need to be installed on to your hard disk – the *SID* program itself and an extra file called 'SID.Config' which should be copied to the S directory of your hard disk's boot partition. You'll probably have to make a number of changes to the config file (using a standard text editor like MEmacs) so that *SID* uses commands on your hard disk rather than those on your *SID* floppy disk.

If you're using the standard Workbench startup, then the keymap should already be changed to GB. If it doesn't, then just add the line 'SetMap GB'. Easy really! ***JH***

AM WHO?

Where can I get a driver for my Amstrad DMP-2160 printer?

AG Matthews
Lindford
Hants

The EpsonX[CBM_MPS-1250] driver on the Extras disk might work, or maybe the EpsonXOld one. If not, I reckon the Star9Plus driver on Jamdisk 5 (from *JAM* on 0895 274449) will work with the DMP-2160. ***JW***

FILE SWATTER

I have tried editing a file from Shell as follows:

```
ED MyFile
```

But when I create a file longer than about 150 lines I get an error saying my Workbench disk is full. So I continue editing the remainder on a second disk called DATASCAN.

This is easy enough but when I try to copy the original file on to a second disk, it overwrites the original. I want to add the second lot of text underneath the first lot – how?

Dave Homan
Liverpool

Your first file is being overwritten because both have the same name, but AmigaDOS has a command to join two files together like this (called appending – because the second file becomes an appendage to the first). You should do all your editing on the second (blank) disk in the first place and this should not happen – at least not for a long time. Since you only have one drive, you can join the two files together like this:

```
COPY MyFile to RAM:FileA
COPY DATASCAN:MyFile to ↵
RAM:FileB
JOIN RAM:FileA RAM:FileB AS ↵
DATASCAN:MyFile
```

This uses your RAM disk as a second pair of hands. More information on this sort of operation is covered in my monthly AmigaDOS section. ***MS***

SHORT AND SWEET

Can you tell me if there is a PD disk containing the program *MoreRows* or whether the *Overscan* from Workbench 2.0 will work under 1.3.

R Jones
Eastleigh, Hants

MoreRows is available in the Fred Fish collection of disks and no, *Overscan* will not work under 1.3. ***JH***

DEEP THOUGHT?

I am currently using a Facit 4511 printer that is Epson FX-80 compatible, but I cannot get it to run properly. I can't get more than 42 lines per page and commands like bold and italic are completely ignored.

At the moment I am using the EpsonXOld driver as this is the only one that I can get near decent print from. EpsonX[CBM_MPS-1250] is no use, and I have tried the FX/RX driver in *Protext*, but to no avail.

According to a mate of mine who rang Epson, a proper driver is needed as the above drivers are only approximate. I have a handbook, but that may as well be written in Japanese for what sense it makes to me. Is there a proper driver for the Facit 4511.

I do a lot of work on it for Amnesty International as I am a group co-ordinator for a regional action network; life would be a lot easier if I could get this printer to perform as printers should do.

Jim Beard
Malvern, Worcs

That Facit's a bit of an antique as printers go these days, Jim, about six years old. However the EpsonXOld driver should (in theory) work perfectly well with the 4511.

I have a suspicion that your dip switches are all over the place, hence the wide line spacing and only 42 lines per page. I think the best way to get you sorted out is for you to phone Facit (☎ 0634 868000) and the people there will guide you as to how to set the 4511 up for the Amiga. Ask to speak to Terry Voisey, Gary Saunders or Graham Hornsey. Good luck, and keep, up the sterling word at Amnesty International. ***JW***

FOUNTAIN OF OUTLINES

How can I get the outline fonts supplied with Workbench 2 to work on *DPaint III*. I have followed the instruction in the manual but I get an error: "Cannot open diskfont.library V37"

Also, can I get a lead to connect my Commodore 1901 monitor to my Amiga as it has RGB analogue and digital pins. Trilogic claimed it could not and said it would cost £50 to put a SCART (Peritel) connector on it.

Peter Herman
County Durham

As you have probably gathered *DPaint III* (and *DPaint IV* come to that) does not handle outline fonts, but it can cope with bitmapped fonts created by *Fountain*. *Fountain* requires Workbench 2's version of the diskfont.library (stored in LIBS:). The solution is to boot Workbench 2, start *Fountain*, create bitmaps in the sizes you require and store them on the *DPaint* disk.

A couple of further points are worth noting here: *Fountain* is very slow and requires a lot of memory – the exact amount depends on the size and complexity of the bitmap it's trying to create. Also, many older programs will not be able to recognise larger font sizes – some are limited to just 24 point. This should not affect *DPaint*. However you should boot Workbench 2 and start *DPaint* from that disk to be on the safe side. Alternatively, you can copy "diskfont.library" from the LIBS drawer of your Workbench disk on to your *DPaint* disk's LIBS drawer.

As regards your 1901 monitor, Trilogic is more or less correct in stating that it is not directly compatible with the Amiga. Further to this I hope to be running details on the modifications in the near future. If you can't wait that long, contact Meedmore Distribution on ☎ 051-521 2202, who can supply the information and cabling you will need as well as a multitude of others – so make a note of that number. ***MS***

FAST OR SLOW?

a) Flicking through a number of back issues of *Amiga Shopper*, I've noticed that quite a few ads refer to hardware and software as either 'fast' or 'slow'. The only comparison I have is with the Amstrad 8256 which I presume is 'slow'. What does this mean?
b) I already own a Centronics 8PPM laser, 300 dpi serial connector and font character card F1 which emulates the Diablo 630 and the Epson FX80. Will this printer work with the Amiga?
c) Advertised throughout your magazine is the A500 Plus which is upgradable to 2Mb of Chip RAM. I've also noticed that Commodore has just released the A1500 Plus but I understand the Chip RAM inside the A1500 cannot be taken any further than the standard 1Mb. Are the chips inside the A1500 the same as the A500? If not, does this mean that the A500 is more powerful than the A1500?

Anon

a) The terms 'fast' and 'slow' refer not to the add-ons or software, but to the type of RAM inside the Amiga. 'Slow' RAM used to refer to the additional 512K of RAM which could be added to 1.3-based A500s, but Commodore quickly dropped the expression. Slow RAM is basically cheap Fast RAM.
b) As far as I'm aware, your printer should work fine with the Amiga. Workbench 2.0 comes complete with drivers for both the EpsonX range of printers and the Diablo 630, so you shouldn't encounter any problems.
c) From a memory point of view, the A500 Plus is more powerful than the A1500, but it's generally cheaper and easier to expand the A1500. Not only that, but there's quite a lot of hardware (24-bit cards, video cards and processor accelerators) which is only available for the A1500. If you don't need these sort of add-ons, then go for the A500. ***JH***

P-P-P-PANASONIC



I am using – or attempting to use – a Panasonic 1124i with my Amiga 500 and regularly get random letters at the start of the page, usually 'PPP'.

I am using the EpsonQ driver, although the Panasonic handbook recommends a driver for the 1124i, 1124, Epson LQ-850, or Epson LQ series in that order of preference.

Is there to your knowledge a better driver for the Panasonic 1124i than EpsonQ?

B Harrington
Walgrave, Hampshire

Nothing for the 1124i, but the PanasonicPlus driver on Jamdisk 3 (from *JAM* on 0895 274449) was written for the 1124, so that looks like your best bet. ***JW***

FOUNTAIN OF KNOWLEDGE

I bought my Amiga A500 Plus in December of last year and I have been steadily working through the Workbench manual without too many problems. I have however encountered problems with the Fountain utility on the AmigaFonts2.0 disk.

Following the instructions within the manual, I created a file for the user-startup with contains the line –

```
ASSIGN FONTS: AmigaFonts ↵
2.0: DEFER
```

I then saved the file and then exit. I placed the AmigaFonts disk in my second drive, the Workbench disk in my internal drive and then rebooted my machine. Once the machine had booted up, I inserted my 2.0 Extras disk into the external drive and loaded up the *Fountain* program. However, after a few seconds disk access, *Fountain* failed to load and I was informed that *Fountain* had terminated because it was unable to load 'diskfont.library version 37'. What am I doing wrong?

Roger Shiwnath
Sydenham
London

Before we go any further, it's important that you understand how Amiga fonts actually work. For the Amiga to display a font, it needs access to two sets of files – the definition files for the fonts themselves and a system file called 'diskfont.library' which tells the Amiga how to use these files. Without either, you'll be stuck with just Topaz, the system font that is built into ROM.

Unfortunately, these two sets of files aren't located in the same directory and therefore the Amiga has to look into two separate directories to find them – one called FONTS: (for the font files) and another called LIBS: (for diskfont.library). Although the standard Workbench 2.0 disk has a diskfont library in its LIBS:, it is not compatible with the outline fonts included on the AmigaFonts2.0 disk – these require an enhanced version of diskfont.library which is in the LIBS: directory of the AmigaFonts disk.

What you must do is copy the diskfont.library file from your AmigaFonts disk across on to your Workbench disk. You'll also have to change your user-startup file because the version you have created won't work. Change it to read 'ASSIGN FONTS: AmigaFonts2.0:Fonts DEFER' and everything should now work fine. ***JH***

BRING ON THE MAC



I would like to run Apple Macintosh programs on my Amiga 500. I have a 512K memory upgrade, giving me a total of 1Mb.

Is there an Apple Macintosh emulator available for the Amiga? Do I have enough capacity to run Apple Macintosh programs such as *PageMaker 2*?

I have been considering buying a hard drive, can you tell me what is the best buy? With a hard disk, can I use my Amiga like an Apple

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JARGON BUSTING • JARGON BUSTING

Chip RAM – the area of the Amiga's memory directly accessible by the custom graphics and sound chips. Originally a maximum of 512K, newer machines fitted with the fatter Agnus graphics chip can access 1Mb, enabling smoother animations and more screens to be displayed at once. The new A500 Plus comes with an Agnus chip capable of addressing 2Mb of Chip RAM.

Fast RAM – extra memory which is not Chip RAM. The custom chips cannot access it, and because such accesses to Chip RAM can block out the central processor and slow down its own accesses, Fast RAM is faster.

Point – a standard unit of typesetting measurement equal to 1/12th of a pica, precisely 1/72nd of an inch in desktop publishing (approximately in conventional printing). The height of a font – the distance from the top of the highest ascender to the bottom of the lowest descender – is normally expressed in points.

24-bit graphics – normally, the Amiga uses between one and five bits (binary digits) to store the colour of each pixel (picture element) of a display. This means that between two and 32 colours can be displayed. Hardware add-ons are now becoming available which use 24 bits per pixel, giving a possible 16.7 million colours.

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Macintosh, for example when I switch on will all programs be available to use?

Darryl White
Craigavon
Norn Iron

Yes, there is an Apple Macintosh emulator for the Amiga called A-Max II. The package consists of a cartridge that plugs into your Amiga's external disk drive port and two disks which contain the A-Max II software.

In addition to A-Max II you will need a set of 128K Macintosh ROM chips. This is the only other *required* hardware item, but to make your life much easier you will want an external Macintosh (or compatible) floppy drive to read Macintosh disks. Software-wise, you will need a set of the Macintosh System Software, version 4.2 to 6.0.5. The developers of A-Max, Readysoft, says that it has completed a version that works with System 7.0, and this will be released with A-Max II Plus, an internal card for the Amiga 2000 and 3000.

While A-Max II is operating your Amiga is for all intents and purposes a Macintosh. The list of major applications that run on A-Max II is extensive, and includes *PageMaker 2, 3* and *4*. A-Max II will use all available memory in your Amiga, and you will almost certainly require more than 1Mb to create anything substantial within *PageMaker*.

Not all Amiga hard drives are supported by A-Max II, but most popular SCSI hard drive controllers are compatible, including those supplied with the Commodore A590, the GVP Series, ICD IDE and ICD SCSI, Supra's A500 Byte Sync Controller, Amiga Loads Faster (ALF) and Xetec's FastTrak. You ask which is the best hard drive to buy, which is akin to asking which is the best car to buy; short question, long answer. I recommend you read the article on hard disks in *Amiga Shopper* issue 12, starting on page 18. ***JW***

SAS DEFEATED

I am using Lattice C (version 4.0). When I try to compile my source code,with the lc -l command, I keep getting a function return value mismatch warning. It still compiles my source code but does not link it. What is going wrong?

Simon Hoad
Bognor Regis, W Sussex

You've got two separate problems. The reason that the compiler is not linking the code is because you are using the wrong lc option. To automatically invoke the linker you need to use an uppercase L not a lowercase one. If you use this sort of command line scheme:

```
lc -L filename
```

you will find that all will be well.

The warning messages that are being seen are nothing to do with the above slip. The messages are telling you that you are not using particular functions in the way that they were intended to be used. Most of the time the warning occurs because the return value is being assigned to a variable with a different type value but whether this indicates a program fault or not depends on what you are doing. You've not provided any code but if you are quite sure that your code is OK then the warnings can be eliminated by casting the function return value to the same type as the variable being assigned. ***PAO***

WRONG DRAWER

I am relatively new to computing so when I got my Amiga 500 Plus I sat down with the Workbench manual and gradually worked through it. When I came to start using my printer (Star LC24-200), I couldn't copy the EpsonQ printer driver on to my Workbench disk.

The EsponQ icon does appear in the Prefs window when I select Show All Files, but when I open run the Printers program to set the printer preferences the only driver that shows is the generic one.

I followed the instructions in the manual for copying the driver to the word. I've spoken to other people and none of them can help, they seem to have no trouble at all.

BWD Russell
BFPO 39

Actually, you've misread the instructions slightly. The EpsonQ icon needs to be dragged into the Printers drawer that is inside the Devs drawer on your Workbench disk.

Double click on your Workbench disk icon to open the disk window. Select the Show All Files option (if it isn't already on). Find the drawer called Devs and double click on it to open it. Inside the Devs drawer find the drawer called Printers and double click on it to open that drawer. This window is the one the EpsonQ icon should be dragged into for the Prefs/Printer program to include it in the list of printer drivers. ***JW***

ACCELERATED EMULATOR

a) I have a four year old NTSC A500 and am interested in obtaining a processor accelerator and PC emulator to fit inside an already cramped micro which contains a Multistart II ROM switcher (with home-made toggle switch). Can you recommend something suitable?

b) Also, I recently fitted a Super Agnus chip and have now noticed that the graphics start to flicker in games such as Turbo II. Will fitting a Super Denise help or is this a known problem anyway?

Dave Hartje
Campbeltown

a) I haven't seen the Multistart II but if it can hold three ROMs as you describe that doesn't leave much room for anything else. If you do want to fit a processor accelerator the only thing that would fit will be a 16MHz 68000 – but the speed increase is negligible due to excessive wait states in the rest of this 8MHz design. You could replace the Multistart with something more restrained such as a piggy-back design – personally I prefer a single ROM (version 2) and to heck with a few games.

The only real choice of PC emulator for such a system would have to be the KCS Power PC board. AT-Once occupies the processor slot which the accelerator would require; and on that front I'd give the VXL-30 a good hard look. The 40MHz version with 32-bit RAM should really fly.

b) This could be a software problem – then again it might not be. It's more likely to be something amiss in the machine – and from some of the mods you have made this could easily be the cause. Early Fatter Agnus chips could be configured for PAL or NTSC just by clipping a lead. If that isn't insulated correctly, it may cause the interference you describe. My advice? Take the machine to a repair centre for a good overhaul. ***MS***

IN THE PICTURE

I use *PageSetter II* for DTP and I need a black-and-white scanner, for less than £100 if possible, in order to scan photographs and pictures.

The speed of the scanner is not that important, but quality is. Which do you recommend?

B Harris
Headingly, Leeds

You lucky person, you. There's a full Amiga monochrome hand scanner round-up in this very issue, starting on page 16. Only one of them costs less than £100. ***JW***

CONFUSED? YOU WON'T BE

I don't have enough memory (1Mb) to run *DPaint 2* properly – I keep getting "Out of memory" errors. My friend suggests I get a GVP Impact hard drive with 2Mb fitted – but would that be enough? I could buy an 8Mb Supra 500RX for that money. How much memory do I need to run my art packages successfully and what sort of memory will do the job? Finally, can you recommend an art program for designing leaflets etc.

How long is a piece of string? I get asked this question time after time but at the end of the day the amount you need depends on you. *DPaint 2* will run as happily in 3Mb (if you got the GVP) as it will in 9Mb if you opted for the Supra. For my money, combined units are always better value. With the GVP option, as your pal suggests, you get the speed and convenience of a hard disk and

INTERSTELLAR PLOT

I'd like to get a program to produce an astronomical planet date/position line graph on the screen. I'd then like to go a step further and plot variable star graphs in a similar fashion. Would a spreadsheet program do the job?

F White
Hoole
Chester

Spreadsheets like *MaxiPlan* have good graph presentation facilities but whether it would be suitable for your needs would depend entirely on the type of formulae you are working with and the accuracy needed. You've not supplied either but, on the face of it, I would imagine that a spreadsheet like *MaxiPlan* could do the job very easily.

If you are reasonably competent with Basic you could of course write the graph-plotting program yourself. One book which dealt in some depth with such terminal plotting and co-ordinate translation was *Advanced Basic Applications and Problems* by James Coan. It was published by the Hayden Book Company but I am not sure whether it is still in print nowadays. Most advanced basic books do however provide some coverage of the sort of graph-plotting facilities that you would need.

A third possibility is to try some of the public domain libraries. Although I haven't got a current catalogue I believe that Akore Software (which can be reached on ☎ 0800-252221) offers a number of disks with graph plotting and astronomy-orientated programs on them. ***PAO***

enough memory to do what you want – plus you'll have plenty of room to store your drawings. In your case, the Supra, frankly, is overkill. You'd need that amount of RAM for running lots of memory hungry programs (*Pro Page*, *Vistapro* etc) at once.

DPaint 2, by the way is fine for designing leaflets, but *Amiga Shopper*'s sister magazine, *Amiga Format* recently gave away Gold Disk's *Page Setter*. Combined with *DPaint* this will give you the power and flexibility you want. Add a hard drive and you'll never look back. ***MS***

GREYSCALE TO COLOUR

I am interested in grabbing colour images but *Digi-View Gold* and a video camera will cost hundreds of pounds. Is there any way of colourising greyscale images from a hand scanner? Is there a colour scanner available?

Mark Smith
Liverpool

Sure there's a way: you simply load the 16 level greyscale into an art package and alter the colours. You'll probably need to drop into lo-res mode, increase the palette to 32 colours, change the upper 16 colours to those you choose to colourise the image with, and then start painting. Fiddly, yes, but it can be done.

If you mean "is there a program that will do it automatically?" – of course there isn't. If this was possible then the scanning software could have colourised it to start with.

Power Computing is planning to release a colour hand scanner for about £250. The software is still in the early stages of development as I write, so don't go holding your breath. ***JW***

STRUNG OUT



I am currently working on a graphical interface and am experiencing problems when attempting to read floating point numbers from string gadgets. As I understand the situation I have to convert a NULL terminated string stored in the StringInfo structure, pointed to in the SpecialInfo field of the String Gadget structure. When I use the standard C function atof() on the buffer field of the StringInfo field I repeatedly end up with the value 0.0000. I'd be most grateful for any hints as to how to get around this problem or indications of what I may be doing wrong.

Niall Davis
Karlsdorf, Germany

It's a great pity that you didn't provide your code because without it, it is difficult to be sure where your problems lie. I suspect however that the reason that the atof() function calls are returning a zero value is because they are being provided with a zero or nonsense value rather than the string equivalent of the number entered into the string gadget. This in turn would suggest a pointer related problem – so, I think the first step you need to take is to add some debugging code in order to see exactly what values you are providing atof() with. Read the StringInfo buffer, extract the string and use a temporary printf() function call to print it at a CLI/Shell window. If the value is not what you expect then your problems may lie in the way you are extracting the string or in the way in which you've set up the string gadget in the first place. If, by chance, you are correctly reading the string and the problem does lie in the use of the atof() function it might be something as simple as you not including the appropriate header file. Either way I'd need to see the code and be told what compiler you are using in order to decide exactly what's going wrong. ***PAO***

GO FOR IT!



I have an Amiga 500 Plus, a Canon BJ-10ex printer and Gold Disk's *PageSetter II*.

EpsonQ is the recommended driver for the BJ-10ex. Having selected this, I have a choice of seven print densities from *PageSetter II*. The BJ-10ex will print up to 300 by 300 dpi, but this isn't included in the seven on offer. I can opt for 360 by 180 dpi, but is this a compromise?

Could I select the HP_DeskJet driver instead, as this has 300 by 300 dpi available?

Canon says it will supply me with a driver if I send a disk, but how would I use it with my set-up?

In the *PageSetter II* info there's mention of other Compugraphic fonts being available in the future; there are only two included, Helvetica and Times. Gold Disk hasn't produced any more, do you know of any in the public domain?

If I create an A4 sized document that contains a lot of very large characters, I can only print part of the page and then a box appears telling me there's not enough memory to complete the printing. If I reduce the scale in the Print requester to about 80%, it prints out OK. Would a trapdoor expansion help with this?

Stuart Roberts
Southport, Merseyside

Yes, a trapdoor expansion will give you more memory and allow you to create and print bigger documents with *PageSetter II*. The rule with DTP is always "the more memory, the better".

Gold Disk does produce more Compugraphic fonts, the most popular being the Outline Fonts Pack which basically contains the 'classic 35' fonts that you get in a lot of PostScript printers. Check out the mail order advertisements; it costs about £80. There are no public domain Compugraphic fonts at the moment, but the latest version of *Professional Page* comes with a utility that converts Abode Type 1 fonts, of which there are a lot in the public domain, into Compugraphic fonts which can be used by *PageSetter* as well *Professional Page*. So keep your eyes peeled.

Now the BJ-10ex. Its best resolution is 360 by 360 dpi, not 300 by 300 dpi. Get the driver from Canon, copy it into your 'DEVS:printers' directory and use Preferences to select it and save the choice. After this you'll find that *PageSetter II* will give you a 360 by 360 choice on Density 7.

You'll need to set the BJ-10ex into BJ-130e mode first by flicking one of the dip switches. The manual will tell you which one, I think it's number 10. After flipping dip switches you must power down the printer and then power up again for the dip switch changes to be noticed. ***JW***

JARGON BUSTING • JARGON BUSTING

Agnus chip – the custom chip dedicated to graphics. The first three versions – 8361, and the 8370 and 8371 Fat Agnus – can access 0.5Mb of Chip RAM. A later version, 8372a, can access 1Mb; while the ones used in A500 Pluses and A3000 can access 2Mb.

Compiler – a means of translating a program to render it understandable to the computer. A compiler translates the whole thing into machine code before it is run. The compiled program is generally much faster than its interpreted counterpart.

Linker – a program which joins together the various segments of code produced by a compiler, along with any relevant library routines, and produces a finished, executable program.

ROM – Read Only Memory is used to store essential programs, such as Kickstart. The programs are held permanently, and are not lost when the power is switched off.
No new information can be written to ROM.

ROM sharer – a device which will hold more than one ROM (the chip in which Kickstart is stored) and enable the user to choose which version to use.

WHAT COLOUR MONITOR?



I wish to purchase a good colour monitor for my Amiga 500 and need some advice. My Amiga handbook recommends Analog RGB monitors with 4096 colours and 640 x 512 pixel resolution. Most dealers have Philips CM8833 MkII and Commodore 1084D monitors, but these do not appear to have a high enough resolution.

I have purchased different magazines and there seem to be so many different monitors on the market (with so many resolutions and features) that I am now very confused.

Can you give me some advice on which monitor to buy. I am looking for good colour and stereo sound, with no flickering and low radiation.

AS Osman
Leicester

Well, I've just checked my (admittedly rather old) Amiga 2000 manual and I quote the following:

"The Amiga 1080 and 2002 monitors feature an analog RGB input which allows display of the Amiga's 4,096 colours on a screen with 640 x 400 resolution." (Note the American references to NTSC (400 line) resolution, and the obsolete monitor numbers!)

This is probably similar to what you read in your Amiga 500 handbook. It refers to the Amiga's output, not the specification of the monitor, which seems to be what is confusing you. The analog RGB input of the monitor is used to take the RGB output from the computer.

Both the Commodore 1084D and the Philips CM8833 MKII monitors work perfectly well with the Amiga, and are undoubtedly the most popular RGB monitors in use among the Amiga community. You will have no trouble connecting either of these to your computer. In fact, I've been using an original Commodore 1081 monitor since 1986.

However, if you really can't stand the idea of flickering (which isn't half as bad as some people seem to imagine) then you'll have to buy a multi-sync monitor and a device to fit inside your Amiga with a name such as Flicker Fixer or Display Enhancer.

This will convert your Amiga's normal 15.6KHz output into the 31.2KHz signal required by a multisync. Doubling the display rate effectively cures the flickers, but it will set you back several hundred pounds extra.

Lastly, I wish I could help you on the radiation question, but I really wouldn't know where to start. Maybe you could try writing to Commodore, Philips, and other TV manufacturers and request data. Or see if your local Citizens Advice Bureau or library can point you in the right direction. ***GW***

SOUNDS RIGHT



I would like to connect my Amiga to a better speaker system than the present TV speaker. I have a budget of about £60?

Paul Docherty
Renfrewshire

There are several amplified speaker systems around for a lot less than £60. You can start from about £40 for the Zye-Fi and work up from there. Sony does a nice set for around that price range but it is meant to match up with a personal stereo, which is a pity. Your local computer dealer will be able to set you up with the Zye-Fi. You might also try Tandy which does a wide range. Whatever you do get, you'll be able to enjoy your Amiga's sound in glorious stereo – as it was intended. ***MS***

LINE UP NOTEPAD



I recently bought a Citizen 124D printer for use with my machine and am using the EpsonQ printer driver to drive it. However, when I try printing from Notepad using "Print As...", a solid line is printed across the width of the page. This also appears about half-way down the page where the "paper" is about to scroll. Help!

Alex Wallace
West Lothian

There's a simple solution – don't use *Notepad*! Quite seriously this piece of software is not geared up to the job – it's a freebie; and an old one at that which has been dumped for Workbench 2. Your printer will be fine if you use some decent software such as *PageSetter* supplied with Issue 34 of *Amiga Format*. Alternatively there are dozens of commercial, PD and Shareware word processors and text editors which will do the job better. ***MS***

RAVE REVIEW



I am into rave music and have sampled bits from rave songs (using the Trilogic sampler) and produced my own using *Noisetracker*. The results are fine but the number and length of my samples are limited by memory. I am now considering buying a synthesizer and MIDI interface. What benefits will this give me and will I be able to mix MIDI notes and IFF samples? I can only afford a cheap synthesizer. What is going to be the difference between ones costing around the £100 mark and those which are in the £800 price bracket?

I've tried using Gajit's *Sequencer One* but I don't find it as easy to use as *Noisetracker*. Is *Sequencer One* really worth getting used to? My last point: Whenever I try loading my own IFF samples into Sequencer One it says 'CANNOT READ SAMPLE FROM DISK'. Why?

Chris Priestly
Botley, Oxford

Our early MIDI series articles (which started in *AS* 7) should give you an idea of the advantages of using MIDI. Many Amiga sequencers, including *Sequencer One*, will enable you to use IFF sampled sounds and MIDI instruments together and this will give you the best of both worlds. The more expensive keyboard synthesizers, as might be expected, will have more sophisticated capabilities and will usually be fitted with a touch-sensitive keyboard. Budget price models will not have a touch-sensitive keyboard but unless you are already a competent keyboard player you will find this limitation quite easy to live with in the early days. In most other respects the lower priced synthesizer offerings are very adequate and you should be very pleased with the results. As far as I know there should be no difficulties with *Sequencer One*'s use of IFF sound samples, so I suspect that the problem is that your 'samples' have not been stored as proper IFF files in the first place.

Sequencer One is well worth getting used to and, to be honest, I am surprised that you've had any difficulties in using it. To a large extent *Sequencer One*'s popularity stems directly from the fact that it is one of the easiest of the Amiga sequencer programs to use. You shouldn't have any trouble providing you work systematically through the manual and experiment with the various options. Gajit's *Sequencer One* has recently been enhanced and you might find it advisable to upgrade to the new version when you get your new MIDI gear. The updated form is called *Sequencer One Plus* and you can get more information about the newly added facilities from Gajits Music Software on ☎ 061-236-2515. ***PAO***

SCAN, BANG!



My problems started when I altered my motherboard to accommodate 1Mb of Chip RAM, to use my four-chip 512K trapdoor expansion as the extra 512K of Chip memory. At the same time I bought the GVP series II hard drive, complete with 2Mb RAM installed (SIMMs) and the Power Scanner by Power Computing.

When I run the PD SysInfo program it tells me that I have 1,036,758 bytes of Chip RAM free; 1,870,708 of Fast RAM free; 2,907,466 total RAM free; and 3,137,272 bytes of memory in total. It also says that RAM Speed Vs Chip is +17% and that I have Agnus Type Pal 8371/67 and Denise Type ECS 8373 fitted.

This, I believe, is the way things ought to be.

I can scan pictures, convert to grey, save them as IFF and so on, but not if the picture size is in the region of 500K. Then, while scanning, I get funny lines appearing half way along the image and more often than not the program will freeze.

If the picture was scanned in successfully and saved (around 200K's worth) then I can load the image into *Deluxe Paint II*, but only in lo-res. When attempting to load it in hi-res mode the picture will load but as soon as it is about to be displayed the screen turns black and the program hangs.

However, if the picture is small enough I can get it to load into hi-res mode, but I can only do elementary operations such as draw freehand. Anything as complicated as moving a chunk of the image causes a crash.

I also have documents written in *Pen Pal* on my 512K Fast, 512K Chip days which included a few pictures. Now, however, I cannot load these files – they load, then, just when they are about to be displayed, the screen turns black and the computer hangs.

I know that something is very wrong; it's as if the extra Chip memory is not working or something, even though it is being seen by the CPU.

Please help me as I desperately need graphics in my presentation documents.

Isthiaq Ahmad
Edinburgh, Scotland

There are three things that could be causing the problems. Either you messed up when you made the changes to the motherboard, or the RAM chips in the trapdoor expansion are too slow to be used as Chip RAM – they need to be at least 120 nanoseconds (the four-chip boards are usually OK) – or you've blown the trapdoor expansion.

Tell you what to do: borrow another four-chip trapdoor expansion from a friend and see if the problem persists. If it does, you need to get a professional to look at the Amiga and (gulp) hopefully fix it. ***JW***

THE PLOT THICKENS



I have a Facit 4550 pen plotter which uses Hewlett-Packard HPGL language as the plotter driver.

I want to run it from my Amiga 500 but am unsure as to which printer driver on my Extras 1.3 disk to use, if any. Can you help me? There are a number of Hewlett-Packard drivers on the disk but I don't know whether they use the HPGL language.

Brian Wheatley
Aigburth, Liverpool

You don't need a printer driver to use a HPGL plotter with the Amiga, you need software that supports HPGL output. Typically these will be Computer Aided Design (CAD) packages like *X-CAD* and *IntroCAD* or data plotting programs.

It's not sensible to use plotters for word processing or DTP. ***JW***

JARGON BUSTING • JARGON BUSTING

MIDI – Musical Instrument Digital Interface is a standard devised by electronic instrument manufacturers, allowing a number of synthesisers to be controlled by a single keyboard or sequencer.

CAD – Computer Aided Design applications provide designers with the graphical facilities to design buildings, circuit boards, and so on.

IFF – Interchange File Format is a means by which data from graphics or sound sampling programs is saved in a compatible way. It allows data to be exchanged between programs easily and avoids the situation where different graphics packages save data in incompatible formats.

SIMM – Single Inline Memory Module, a collection of RAM chips in a package.

Touch sensitive – a synthesiser which varies its voiume depending on the force used too strike its keys.

10 Top tips for programming

This month Paul Overaa provides a bit of guidance to give your programming that expert flavour

❶ Design before you code
Always create a logical 'blueprint' of the program you wish to write. You are not aiming for perfection, just something to guide you on the way!

❷ Document from the beginning
Do produce at least skeleton documentation *while* you are developing the program rather than afterwards. This way the program is still fresh in your mind.

❸ Make the most of comments
It may be obvious to you now what actions your masterpiece performs – but it may not be in a couple of years! Use comments to divide the program into named sections to make the program far more readable. See Figure 1 for an example.

```
REM C O L L E C T - M A T R I X
   COLLECT:
   FOR ROW%=1 TO N%
      FOR COLUMN%=1 TO N%
         PRINT"A (";ROW%;",";COLUMN%;")...  ";
         INPUT U(ROW%,COLUMN%)
         A(ROW%,COLUMN%)=U(ROW%,COLUMN%)
      NEXT COLUMN%
      INVERSE.L(ROW%,ROW%)=1 'Not relevant to the collection of
                             'the matrix - it's just that this
                             'input loop is a convenient place
                             'to set up an identity matrix.
   NEXT ROW%
   REM ______________________________
```

Figure 1: Use REM statements to isolate, and document, your code sections

❹ Use clear variable names
Nowadays Basic allows the use of long variables names, so make the most of this facility to create helpful, descriptive, code. Admittedly code written in this style will take longer to type, but it is guaranteed to make a more sense than the cryptic use of variables named 'A', 'B' and so on.

❺ Minimize the use of globals
Global variables are variables which can be accessed (and changed) from anywhere within a program. Although they are useful at times (error indicators and program exit flags are examples of where global variables can be used to good effect) it is usually better to create isolated procedures which work with local copies of any data that is passed to them.

❻ Keep your code clean
Isolate any control sequences that your program might need so that the main body of code is not littered with awkward-to-read statments like this MIDI/serial-port related fragment...

```
PRINT# 1,CHR$(&H90 OR ↵
channel)+CHR$(note)+CHR$↵
(velocity);
```

Embedding these types of control sequences will make your programs look messy and more difficult to maintain. The best idea is to isolate the sequences into separate subroutines or functions. For the above example the preliminary user-defined function definition...

```
DEF FNNoteOn$(note,ch)=CHR$ ↵
(&H90 OR ↵
ch)+CHR$(note)+CHR$(64)
```

would enable the rest of the program to send its data by using the more readable expression...

```
PRINT#1, ↵
FNNoteOn$(note,channel)
```

❼ Isolate the I/O Code
Try to to eliminate all I/O and machine dependent statements from the main parts of code. Instead access these facilities indirectly. You do not want statements such as...

```
PROMPT$="Please enter a ↵
record number"
COLOUR 1,4
SAY TRANSLATE$ (PROMPT$) ↵
INPUT       etc.
```

This would mean that the program was linked to the computer on which the program was writtten. The best idea is to reference the facilities using function calls, subroutines or, subprograms...

```
FNSetScreenColour(RED)
GOSUB UserMessage
GOSUB CollectInput : ↵
REM Get record number
```

These are useful if you want to write programs that can be easily moved to other machines. In these cases, aim to eliminate all screen graphics commands, data input or other I/O and O/S specific references from the main body of the code and place them in a set of isolated subroutines at the end of the program. To get such a program running on another machine you will probably have to re-write most of those I/O or O/S related calls... but the important point is that you are unlikely to have to alter the main body of code.

❽ Subroutines which do nothing
You might be forgiven for thinking that subroutines which do nothing serve little purpose. In fact routines, as shown below, can be useful...

```
REM D O - N O T H I N G
DoNothing:    RETURN
```

Supposing an input value S has five different possible states and, depending on the value of S, a program has to execute one of five subroutines. The code could be based on an arrangement such as...

```
IF (S >0 AND S <6) THEN ON ↵
S GOSUB A, B, C, D, E
```

where A, B, C, D and E are the subroutines which perform the processing associated with the five values. During development some of these may be non-operational (or non-existent), so you need some way of preventing certain subroutines from being executed. Suppose you wanted to prevent subroutine C from being used in the above example – just replace the reference to subroutine C with a reference to a subroutine that does nothing, like this...

```
IF (S >0 AND S <6) THEN ON ↵
S GOSUB A, B, DoNothing, D, E
```

The approach is useful when you have a large number of possible test values and where not all values require a subroutine to be executed. One example is the execution of routines performed when control characters are detected. On the basis of detecting keypresses related to particular control codes you may wish to perform certain subroutines but in all probability you will not wish to support all possible control characters. Executing a 'Do Nothing' routine for all control characters that you do not wish to support provides an easy solution.

❾ Plan for the unexpected
Your program should be user-friendly but don't expect the user to be program-friendly. Assume that the user will make all possible mistakes as far as use and data input are concerned and plan so that your programs do not come to a grinding halt when a user puts a wrong disk into the drive or supplies a wrong input value. Programs should provide error messages (and helpful prompts) to guide the user back on course.

❿ Keep it simple
Clarity will pay off. Remember, one day you may need to look at (and understand) the code you wrote years ago in order to make changes.

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Vector's House

Jeff Walker checks out ExpertDraw, the new structured drawing program that aims to be easier to use while still retaining a fistful of features

The first time you include a piece of IFF clip art in a desktop published document you discover how bad it looks sitting next to that lovely high resolution text.

The resolution of an Amiga IFF or 'bitmapped' graphic is only 75 dots per inch. At this resolution anything but straight lines results in jagged edges that can only be got rid of by scaling the graphic down to a ridiculously small size – halve the scale of the bitmap and you double its output resolution, scale it to 25 per cent the size of the original and you quadruple its output resolution to 300 dots per inch.

But at this scale a graphic that filled a whole 640 by 512 HiRes screen would be output at about two inches square.

Happily there is another type of graphic we can import and use with DTP packages – vector or 'structured' drawings. These can be manipulated any which way you like – enlarged, reduced, rotated, twisted – and they will always output at the highest resolution your printer is capable of.

Structured drawings are able to keep their resolution because they are not bitmapped. Instead of the picture being described in the file as a 'map' of dots, structured drawings are remembered in the file and in memory as mathematical formulae which describe the lines and shapes that comprise the complete drawing.

For example a bitmap graphic that draws a curved line on the screen would contain information that says something along the lines of: "Put a dot here, and another next to it, and another next to that one but up one pixel..." and so on until the whole curve is drawn. A structured drawing that produces a similar curve contains information that says: "Plot a dot at the starting point of the curve, plot another dot at the ending point of the curve, and now insert those co-ordinates into the mathematical formula which draws the curve that the user specified.

So if you change the start and end points – by enlarging or shrinking the curve for example – the resolution is retained because the new co-ordinates are simply put through the formula again and the curve is redrawn.

And when you send a structured drawing to the printer its mathematical description gets recalculated all over again to take into account the resolution at which you are printing.

You may have bought some structured clip art to use with your DTP package, and if so you will have discovered how slowly the graphics appear on the screen, especially if you are working in colour. Now you know how structured drawings work, perhaps you'll understand why they take so long.

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IFF – Stands for Interchange File Format. Many people call Amiga graphics IFFs when they they really mean IFF ILBM – the ILBM stands for InterLeaved BitMap. IFF is the general file format, ILBM is the 'type' of IFF that is a graphic.

Bitmap – Another shortened term for IFF ILBM.

JIGSAW PUZZLE

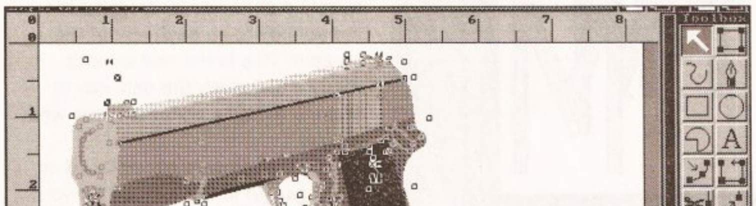
The time structured drawings take to render on to the screen is nothing compared to how long they take to create.

Finished structured drawings are typically composed of many separate simple shapes and lines, known as 'objects'. The trick is putting those objects together so that, when viewed as a whole, they look like a picture of something.

It's a bit like putting a jigsaw together, only with structured drawing you place objects on top of and behind other objects, as well as side by side.

It sounds fiddly, and in truth it is; it is not easy to create good structured drawings without a deal of practice. Any package that tries to make the job easier has to be taken seriously.

The best known Amiga structured drawing package in this country is probably *Professional Draw*. On the Continent they prefer *Aegis Draw*. Both programs have reputations for being slow and a bit tricky to master. German company Gold Vision Communications thinks so at least, which is why it has developed *ExpertDraw*.



Seeing things with a whole new perspective – the Distortion tool lets you create special effects very quickly – Ah! So this is what it looks like when you're peering down the barrel of a gun

EXPERTDRAW

ExpertDraw has four basic drawing tools for creating rectangles, ellipses, arcs and Bezier curves.

The first two tools – for ellipses and arcs – are very easy to use, you simply drag out the shape as you would in any art program. Arcs are created via a requester that wants to know the starting angle (zero degrees is due west, 90 degrees is due north, and so on) and how many degrees of the circle to draw – 360 degrees would draw an arc that is a complete circle. One further option allows the centre point of the arc to be connected to the two ends of the arc, thereby creating a 'pie' with a segment cut out of it.

Bezier curves are the tricky ones, and are what put a lot of people off using structured drawing programs because you need to use Bezier curves to be able to create anything

but simple, childlike graphics. Until you get used to them, Bezier curves (named after the Frenchman who invented them) appear to have a mind of their own.

As mentioned earlier, an 'object' in a structured drawing consists of two or more points, and the mathematical formulae which describe the connections between those points. This flexible system means that the points can be moved, causing the connection formula to be changed, thus changing appearance of the object.

But it also means that points can be added to an object, and this is the bit which confuses newcomers to structured drawing.

For instance, a straight line consists of two points, one at either end. A formula (which is computed by the program) joins those points together and draws a line on the screen connecting them. Add a point to the centre of the line and you still have a straight line on the screen, although this one is composed of three points joined together by two formulae – the start point to the middle point and the middle point to the end point.

This means you can 'pick up' the middle point and move it. The result will be a curve which goes from the start point to the end point, passing through the middle point.

How does the program know how steep the curve should be? Think about it; draw three points on a page in triangular formation and imagine how many different-looking curves you could connect them with.

This is where newcomers get *really* scared, because each of the points has an invisible 'tangent' line which can be rotated about its associated point. The angle of this tangent tells the software at what angle to start when drawing a curve to the point it is connected to, and the length of the tangent describes the 'force' applied to the curve – a longer tangent applies more force and results in a longer line connecting the two points.

If this all sounds highly technical, it is; in truth you do have to understand the 'properties' of Bezier curves to be able to use them properly.

The best way to learn is to experiment, and *ExpertDraw* is easy to play with because it does its best to help you to do exactly what you want to do.

HIDE AND SEEK

To start with, it hides the points of an object, and the tangents which go with those points, unless you ask it to show them; this results in a less cluttered, less daunting, more understandable screen display. Select an object (by clicking on it) and four markers that describe the size of the object appear on the screen, one at each corner of a rectangle. In this mode the shape of the object cannot be changed because you cannot get at the actual points.

But you can move it, resize it or rotate it by selecting the appropriate tool, adjust the thickness and colour of the lines, and alter the fill colours. This, if you like, is 'beginners' mode.

Once you've learnt how to operate the program and gained confidence with your abilities, you are ready to experiment further by clicking the Move Points tool. In this mode the four size markers disappear to be replaced by small black squares all over the object – the actual control points themselves. Point at a control point and drag it, and any lines connecting it to other control points stay attached to the pointer and form a curve between the point being moved and the other control points.

When you are working on an object such as a line or simple polygon it's almost exactly like stretching a rubber band, but I like to think of it more as moulding a lump of Plasticine because you can add another control point between two existing ones and drag that one around, giving you intricate power over the shape of the object.

As yet you cannot see the tangents of each point, so you cannot alter them. By selecting the Show Tangents option you can gain even more power over the length and direction of curves by dragging the control points on each end of the tangent. This is the real experts mode – and really the only way to learn is to fiddle about and see what results.

The developers have placed an Undo gadget in the toolbox, so you can drag something around confident that you can immediately reverse the effect should it not result in what you expected.

QUICK AND SLOW

ExpertDraw has three display modes – Wireframe, Black & White, and Colour.

It fairly zips along in Wireframe mode, although with this display you cannot see any line thicknesses or fill colours – all you get is the outlines of objects. When you get used to structured drawing you'll find that this is the display mode you'll use most, only switching Wireframe off now and then when you want to see how the drawing is progressing.

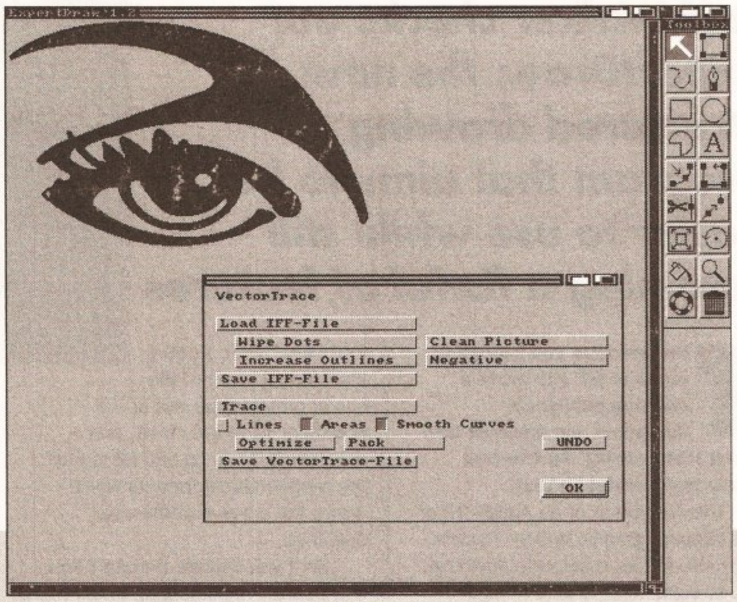
Switching Wireframe off didn't slow *ExpertDraw* down as much as I expected it to, but if you have a lot of objects on your screen it'll take two or three times longer to render them all. The advantage is that lines get drawn as thick or thin as you have specified them to be, and fill colours are displayed.

The colour requester can be used either as a normal RGB palette with sliders, like the one in Preferences, or you enter percentages of red, green and blue into text gadgets. From this you can work out that there is a possible palette of one million colours (100 x 100 x 100), represented on-screen by solid black, solid white, 14 solid shades of grey and various 'patches' made up of grey scale dither patterns.

While the greys and patches on the screen don't reflect exactly the levels of grey output by black-and-white printers, they are a very good guide. For instance, if two shades of grey look almost exactly the same on the screen, the odds are they will look almost exactly the same when printed. This enables you to select contrasting shades of grey for black-and-white output.

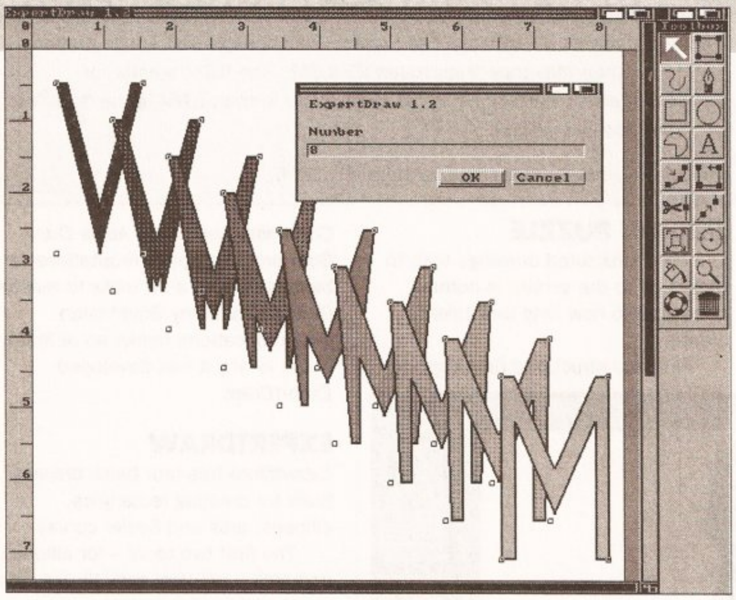
Each time you create a new shade you have to give it a name, and this name gets put into the colours requester and can be selected again later if needed. Any new colours you define get saved with the document, plus you save a separate colours file as well if you like, which can subsequently be loaded into a new document to save you having to set them up all over again.

If you need colours, *ExpertDraw* will let you select or create them using either the RGB system or the



The first step with VectorTrace is to load the bitmap...

Metamorphosis is clever, but of limited use. This example also illustrates the Colour Blend feature



more useful (for colour publishing) CMYK system. Again, percentages for each colour can be entered or sliders can be used.

ExpertDraw is able to create different 'patches' for up to 4,913 colours, all of which can be displayed on-screen at the same time. It achieves this by mixing the 16 default solid colours together into dithered patterns that approximate the actual colour – orange, for instance, would be approximated on-screen by displaying a pattern of red and yellow dots.

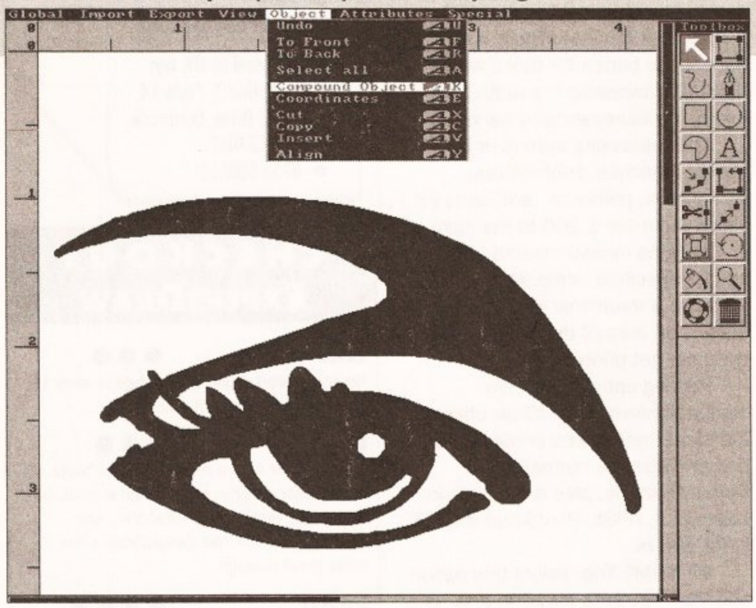
Working in colour slows down *ExpertDraw* considerably, especially in HiRes interlaced mode, and unless you are intending your drawings to be output in colour, it's better and quicker to stick to Black & White.

SPECIAL EFFECTS

There is a fair number of special effects features in *ExpertDraw*. By 'special effects' I mean anything which allows you to automate the process of something that would otherwise take you ages to do by hand.

A simple example would be rotation. Rather than draw everything

...after the tracing process is finished this is what the structured drawing version looks like. Only simple bitmaps result in anything as accurate as this



at an angle, it's much easier to create an upright drawing and, then, after you've finished it group all the objects together and ask *ExpertDraw* to rotate the lot to the same angle.

ExpertDraw allows you to rotate any object or group of objects about a single point – the 'centre' point, which defaults to the central position if the group but can be changed to any point on or off the page – or around a horizontal or vertical axis. The three types of rotation can be mixed, allowing complete freedom of rotation. You can enter rotation angles into text gadgets or click on buttons that step through the rotations five degrees at a time. A small graphic in the requester shows you approximately what effect your rotation will have when you click OK.

As well as rotating objects you can distort them freely in any direction (great fun, but an inexact science), or horizontal or vertical shearing (similar to the effect shearing a brush has in *Deluxe Paint*), or horizontal or vertical perspective, which makes it easy to give an object the appearance that it is laying down flat or protruding out of or into the page.

On single objects the rotation and distortion features work very quickly indeed, but the more points your object or group of objects contains, the longer the graphic will take to recalculate and redraw – it takes about a minute on a standard Amiga 500 to rotate an object made up of about 200 points.

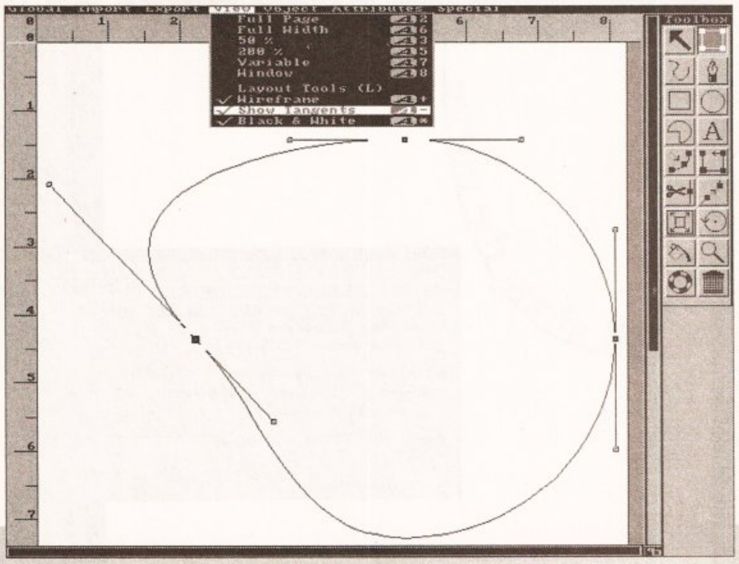
Changing the size of objects, which I mentioned earlier, can be achieved by either using the mouse to rescale it on-screen or by typing a scaling percentage or width and height measurements into a requester. A user-definable on-screen grid is provided and can be 'snapped to' if required.

There are two extra-special effects, Colour Blend and Metamorphosis.

Colour Blend lets you easily blend from one colour or grey level to another colour or grey level, across a range of objects. You select the first object in the group and give it the starting fill colour, select the last object and fill it with the ending fill colour, group all the objects you want the blend to range over, and lastly select Colour Blend.

This feature comes in useful for creating simple things like rainbows or for more complicated 'three-dimensional' objects which have graduated fills to give the appearance of light shining on them.

Metamorphosis changes one shape into another shape in a number of user-definable steps. It only works with single objects – as opposed to a group of objects or a 'compound' object, which is a group of objects combined into one – and the object mustn't contain more than 100 points.



This shape started out life as a circle. The straight lines you can see are the 'tangents' of the four points, and the distortion has been achieved by rotating and 'pulling' on the left-hand tangent

But the starting and ending objects can have a different number of points, and *ExpertDraw* will create more during the metamorphosis as necessary. The maximum number of steps isn't specified in the manual but I tried to turn a square into a circle in 1,000 steps and it worked. The metamorphosis calculation itself took barely 30 seconds on a standard Amiga 500, but the rendering took a deal longer as 1,000 overlapping objects of four points each had to be drawn. With this many objects on a page, *ExpertDraw* pauses for long periods between even simple operations, but then you've given it a lot to think about, haven't you?

So thank heavens *ExpertDraw* has an 'interrupt refresh' feature; by pressing the spacebar while it is drawing something on the screen *ExpertDraw* will not bother to draw any other objects after the one it is working on. The objects are still there on the page, it just doesn't bother to draw them, allowing you get on with something else (such as flipping into Wireframe mode for much faster refresh, or saving and quitting for instance).

Ah yes, almost forgot... if the fill or line colours of the starting and ending objects for a metamorphosis are different, *ExpertDraw* will automatically perform a colour blend at the same time.

A bit more difficult to use than Metamorphosis, but probably more useful, is the extremely versatile Duplicate Object requester. Any number of copies of an object or group of objects can be made, and a vertical and/or horizontal offset measurement can be specified. On top of this, a vertical and/or horizontal scaling factor can be entered, and each duplication of the object will be enlarged or reduced by this amount. A Rotate button allows you to rotate each duplication by a specified number of degrees, either about a single point or about the vertical or horizontal axis.

Incredible effects can be achieved with just a few mouse clicks, although you might have to wait a few minutes for the results to be calculated and displayed.

Several magnification levels are preset – Full Page, Full Width, 50% and 200% – plus there is a variable magnification feature operated either by hitting the magnification tool and dragging a box over the area to be magnified, or by entering a magnification factor into a text gadget.

WORDS TOO

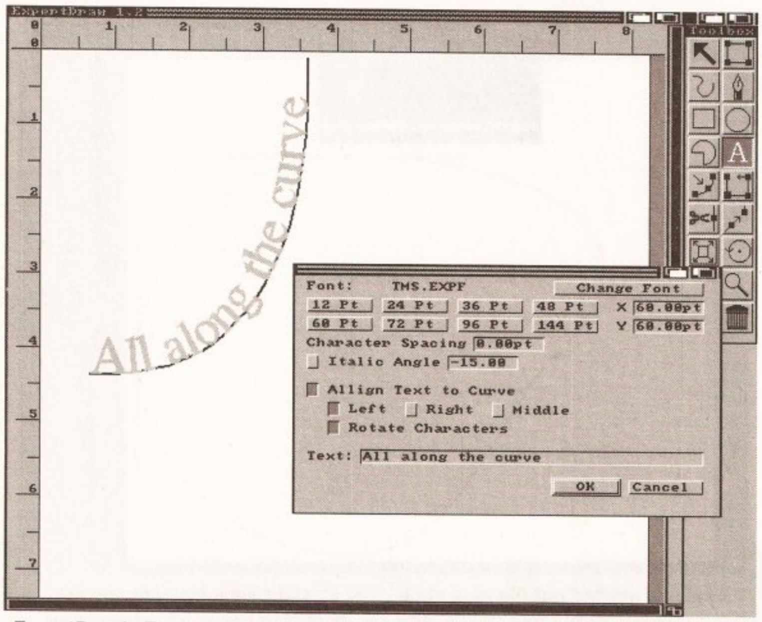
As well as lines and shapes, *ExpertDraw* will let you put text on the page.

The package comes with two fonts, Times and Helvetica, which are of its own format. I mean they are not Compugraphic or Adobe or anything else like that – they are *ExpertDraw* fonts.

Well, in actual fact they are simply special files of compound objects that happen to look like

letters and numbers. Once they are on the page individual letters or parts of individual letters, whole words or groups of words can all be pulled about and manipulated like any other object.

Two fonts isn't very many, and Times and Helvetica are not particularly useful as display fonts, so it's a good job there is an additional utility available which will convert Soft-Logik outline (.DMF) fonts into something which



***ExpertDraw*'s Text tool has a number of useful features, but you only get two typefaces with the package**

ExpertDraw can use. Soft-Logik fonts are easily available in the UK, but the *ExpertDraw* font conversion utility (currently) is not; you'll have to get it direct from Gold Vision in Germany. I'm sorry, I haven't yet been able to find out what it is called – the manual refers to it simply as an "ancillary product" and the UK distributors (Genisoft) said: "Erm..."

There may well be room here for someone to buy the Gold Vision utility and the Soft-Logik fonts, convert them to *ExpertDraw* format and flog them on the public domain grapevine.

Text is entered via a requester rather than typed directly on to the page. A collection of eight buttons allows you to choose from a selection of sizes from 12pt to 144pt, or you can type particular point sizes into X and Y gadgets – fonts can be a different point size wide than high if you like.

Character spacing can be adjusted and any slant angle can be specified.

You can also align text with a curve. To achieve this you have to select the curved object before bringing up the text requester. The text can be aligned to the left or right of the curve, or centred, and characters can be automatically rotated to the same angle of the part of the curve on which they happen to be sitting.

If the whole of the text won't fit along the selected curve, you will be warned, at which point you either need to use fewer words or reduce the size of the font.

Talking of aligning things, any object or group of objects can be automatically aligned in relation to each other or in relation to the sides of the page. For instance, to quickly position a graphic equidistant between the left-hand and right-hand sides of the page you would simply select it and hit the central horizontal align button in the Align Objects requester.

TRACING BITMAPS

One special feature of *ExpertDraw* I haven't mentioned yet is VectorTrace. This takes an IFF ILBM and converts it into a structured drawing. The rest of the world knows this type of operation as 'auto-trace'.

Now don't get excited; although VectorTrace works, the results are inconsistent. Much experimentation with several associated tracing features is required, and at the end of the day – almost literally sometimes, because it can be soooo slow! – you are left with a structured drawing consisting of tens of thousands of points and many, many objects. This means they take up lots and lots of memory, they render on to the screen more slowly than our Editor gets his wallet out when it's his round (runs for cover)... and they take even longer to import into a DTP package and to print.

This isn't *ExpertDraw*'s fault, it's something that happens with all extremely complicated structured drawings.

VectorTrace only works with two-colour IFFs as it is intended mainly to be used to trace black-and-white IFFs of scanned line drawings. If you try to import a coloured picture, *ExpertDraw* will warn you and give you the option to cancel or load the first bitplane of the coloured picture and trace that.

For small, simple line drawings VectorTrace works well, and quite quickly, but for anything even slightly complicated it takes ages and the end result often contains glitches and strange filled areas which weren't in the original bitmap.

I would imagine that the VectorTrace function is something that will get better and better as Gold Vision releases *ExpertDraw* upgrades.

IN AND OUT

ExpertDraw has its own document file format, but import file formats supported are *Professional Draw* (Clips), *Aegis Draw* and *ExpertDraw*'s own VectorTrace format. Objects or groups of objects can be saved as *Professional Draw* Clips or in Encapsulated PostScript Format (EPSF).

Page sizes can be anything you like; a selection of preset sizes can be chosen from or you can type measurements into gadgets. The gadgets happily accept ridiculously large sizes, but screen display problems creep in after about 99 inches by 99 inches. There is a Landscape button for those who don't like swapping the width and height measurements by hand.

The measuring system is a choice of inches, centimetres, millimetres, points or 'real' units (of which there are 1,200 to the inch).

Margins measurements all round can be specified, although this area isn't like a traditional margin – it's a border, an area of the page which does not get printed.

Printing options are fairly comprehensive. *ExpertDraw* utilises standard Preferences printer drivers and provides the normal seven Density buttons, plus it has built-in LaserJet II, HPGL, PostScript and IFF ILBM drivers.

IFF ILBM? Yup, select this option and the page gets saved to disk as a 300 dpi black-and-white bitmap. So a full A4 page will be about 2,500 pixels wide by 3,500 pixels high. Off the top of my head I can't think of a real use for this, except maybe to convert multi-coloured structured clip art into black-and-white IFF clip art.

In my tests the LaserJet II driver worked perfectly every time, and printed the whole length of the page – no cut-off at 10 inches.

The HPGL driver I haven't been able to test because I don't have a plotter, but the file it creates looks correct. The Postscript driver works perfectly.

The Print requester also has Mirror and Negative buttons, plus X and Y scaling gadgets.

For such a sophisticated drawing package the manual is surprisingly short. There is a tiny two-page tutorial to get you going, but apart from that and a handful of example clips, you're flying solo. Despite its relative ease of use, I think this is one program which would benefit enormously from on-line help and a good 'tricks and tips' section in the manual.

Overall, though, *ExpertDraw* is a fast and fairly powerful structured drawing package. Pushing it to its limits in a low-memory situation and in colour mode I managed to crash it once or twice, and there's an obscure bug I discovered (and reported) in the VectorTrace requester that gives a Software Failure every time.

OK, it's no *Pro Vector*. But hey!, it costs four times less. AS

SHOPPING LIST

ExpertDraw £69.95
by Gold Vision Communications
Kurfurstendamm 64-65,
D-1000 Berlin 15
Germany
☎ 010 49 030-883-3505

Distributed in UK by:
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Newlands Drive, Colnbrook,
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CHECKOUT ExpertDraw

Ease of Use ●●●○○
No structured drawing package is easy to use until you've practised a lot

Features ●●●○○
Lacks some of the more powerful tools that vector graphic addicts will expect, but beginners won't know what they are missing and will find *ExpertDraw*'s few tools good enough.

Speed ●●●●○
Pretty nifty in Wireframe and Black & White modes, but gets slower and slower the more objects you put on a page.

Documentation ●●○○○
Describes the features adequately but gives little help to beginners.

Price Value ●●●○○
The RRP is perhaps a touch expensive for what it can do, but if the usual £10-£15 mail order discounts happen it will become much better value

Overall rating ●●●○○
A good introduction to structured drawing, but eventually you'll want more features.

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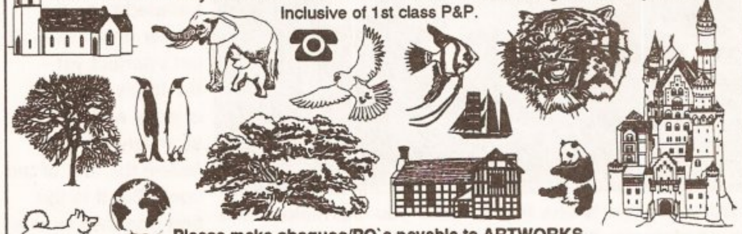
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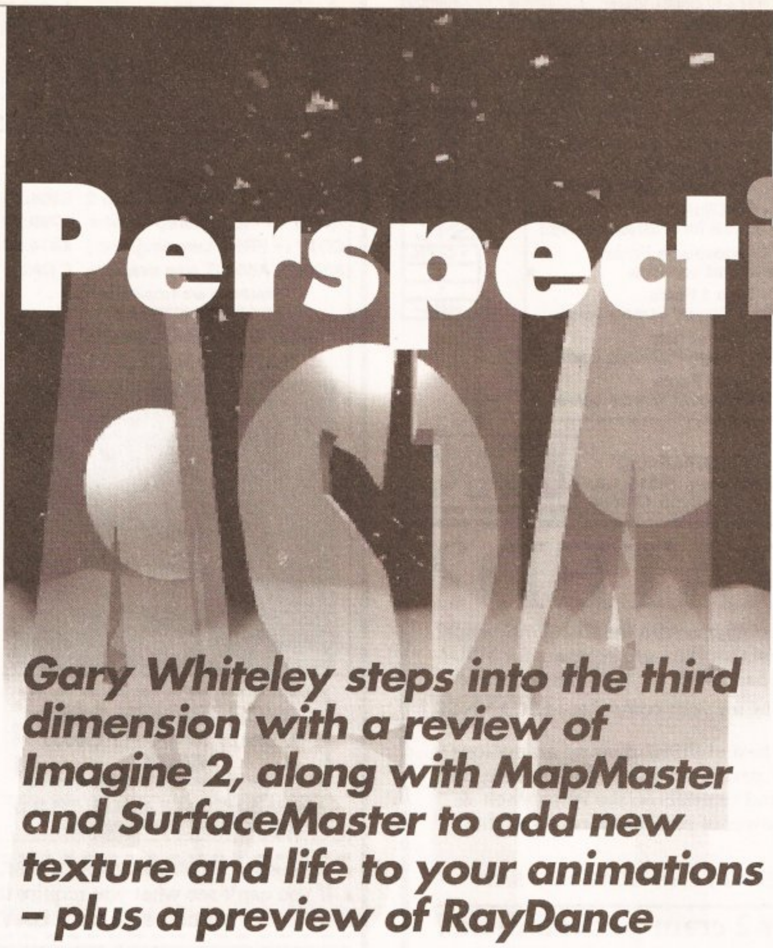
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New Perspectives



Imagine **can now turn bitmap fonts directly into objects – like the letters in this image. Firework effects, spotlights and clouds are also illustrated**

Gary Whiteley steps into the third dimension with a review of Imagine 2, along with MapMaster and SurfaceMaster to add new texture and life to your animations – plus a preview of RayDance

Just under a year ago I was extolling the virtues of *Imagine* (the First Generation). Now Impulse has released version 2, and packed it with new features and improvements. So, I'll be giving you a brief update on that. As well as this, I'll be taking a look at *RayDance*, possibly the fastest ray-tracing software for the Amiga. What's more, there's a review of *SurfaceMaster* and *MapMaster* – two new products which promise to add clout to your animations.

In case you've been visiting relatives on Mars, you probably don't know that *Imagine* just might be the leading-edge 3D-modelling and animation program currently available for the Amiga. It can be a pig to use, but the results can be exceptional. The release of *Imagine 2* continues the journey which began some years ago with *Silver*, one of the first ray tracing programs for the Amiga.



With new objects like this Porsche you can make some great pictures. The lights are 'fog objects' which also emit light – giving a soft, diffused look

IMAGINE 2 – THE NEXT GENERATION

It's apparent that the Impulse team has been hard at work, because in addition to all the new bells and whistles there is at last a decent manual provided – redressing what was, in my opinion, *Imagine*'s worst failing. Novice users should now be able to get a grip on what the program does by studying the manual. Presented almost as one long tutorial, the manual works in short(ish) stages through *all* the program's features, building up a foundation of knowledge as the reader progresses. It isn't perfect yet – the Index has a lot of gaps and is strangely located *before* the end of the book! But it is the first one they've ever had, so perhaps I'm being a bit unfair. And a little more illustration wouldn't go amiss. Still, 500% for effort.

Imagine 2 is now supplied on four disks – and includes a collection of great new objects! As before there are two versions of the program – one for turbocard users and one for those without. And it all installs painlessly on hard disk. So many improvements have been made that it's simpler just to list them than to describe them all in depth. (See boxout opposite).

CHOOSE YOUR POISON

One of my favourite new features is the Preferences editor, which is a real time-saver when used intelligently. With Preferences (not to be confused with AmigaDOS Preferences, you understand) any of the menu commands can be added to a row of labelled buttons at the bottom of the screen. All of *Imagine*'s edit screens (Forms, Detail, cycle, Stage and Action) can have their own set of buttons. So by adding the commands you use most, all you have to do is click on the button and it's activated. In addition, many of the preset parameters such as screen colours, default display mode, function keys and rendering presets can be easily swapped or added to, making *Imagine* even more powerful. Configuration files can be saved and loaded later, so you could define specialised set-ups if you needed to, and load them as you wished.

I get the impression that once

IMAGINE 2.0: NEW FEATURES

Quickrender feature – Render the scene from any of the edit windows in any preset or user defined format.

Set up on-screen user buttons to short cut those trips to the overloaded Pulldown Menu bars. By adding your favourite commands as buttons you can access them with a simple click of the mouse.

Action Editor is now separate from the Stage Editor, making access easier.

There's a **new Preferences option** which makes reconfiguring the program characteristics really simple. Select the options you want to change, add a name, or other parameter, save and use. Much better than the previous, confusing way.

The Cycle Editor now uses the 'Onion Skin,' so that you can see the last move you made – helping you make the next move more accurately.

Improved handling of brush mapping, with auto scaling on to objects.

New feature to select areas of objects to be mapped onto.

Direct support for bitmap fonts – Select a font, type in the text and it's converted into a 3D object.

New feature to define different areas of an object as Smooth or Sharp (ie Phong shaded or not).

New feature to give.an object or light "fogginess" – for making items such as clouds, water, snow or more realistic, diffused lights.

Several new Effects have been included – Boing, Fireworks, Flash, Ripple2 and Tumble.

Stereo 3D returns by popular demand – Use 3D LCD glasses to make 3D animations come to life.

Direct support for DCTV files. Also direct support for Impulses' Firecracker board, which looks like it won't be available in a PAL version though.

Redesign of the entire interface to conform with WB2.0 look.

Greatly improved Forms Editor – At last we can make objects which make sense. (Or at least more sense than they used to).

New textures include Water, which is particularly good and Pastella, which provides a sort of blended camouflage effect.

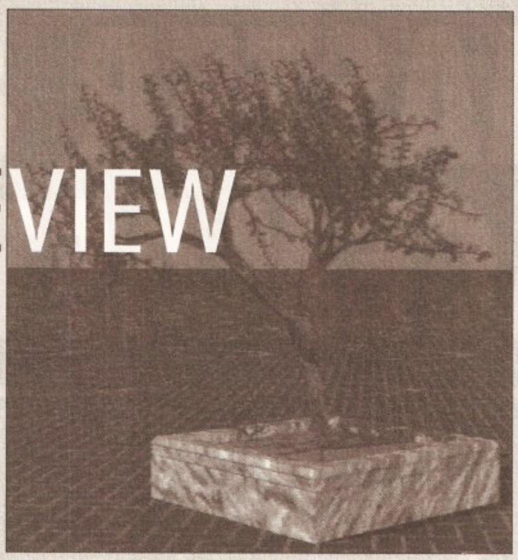
RAYDANCE

A PREVIEW

While we're on the subject of 3D programs I thought you may be interested in hearing about some recent software from the US which looks quite interesting.

It's called *RayDance*, costs $99.95 and it's produced by Radiance Software, which claims it may be the fastest Amiga ray-tracing software around.

RayDance is a script-based ray tracer, providing a number of unusual functions. I was intrigued to learn that it can 'grow' fractal trees, and produce fractal landscapes and 3D Mandelbrot mountains. It can also produce soft shadows and haze and use cloned objects to produce scenes with millions of polygons. All in addition to more mundane features such as 24-bit or 8-bit output, HAM and wireframe previews, tweening of shapes, surfaces, colours, bump maps and object positions, hierarchical object grouping, bump and texture mapping, lathing and extrusion (...phew!). *RayDance* also imports Videoscape/Modeler 3D objects.



An illustration of one of *RayDance*'s unique functions – tree creation. It's even got leaves!

I've been looking at a demo version (non-turbo and turbo versions provided) and I was pretty impressed by the pictures and animations I saw. The demo gives a good taster for the real thing, though it can only use around 1400 polygons and its picture rendering is interrupted every 15 minutes or so until a requester is clicked to continue. There is also no manual (over 200 pages long with the 'full' version), so it's a little difficult to figure out exactly how to make that tree that tempted you to *RayDance* in the first place.

Nevertheless, there are a number of sample scripts provided which can be examined and rendered and which will give you an insight into many of the program's capabilities.



The power of bump and texture mapping is clearly demonstrated on the vases, while in the distance the Haze function blurs the sky and ground together

Being script based, some form of text editor is required. I found the idea of having to 'write' a scene to be a major drawback – the last time I had to do this was with *Videoscape* (and that's a few years ago!). But I can't say I really tried with *RayDance* – I simply didn't have the time to experiment without the manual, though judging by the potential results, I think it may be worth putting up with this shortcoming. A graphical 3D layout editor is apparently in the pipeline which may address this problem, though I have no further details.

There's an on-screen user interface for loading scripts and setting up the rendering characteristics, where screen sizes can be selected and other functions such as reflection depth and shadows are determined and there is also a gauge to show the rendering progress.

Reasonable on-line help is included with the program, so that if you're unsure about a function a short description can be quickly obtained.

Sadly, the current (1.0) version of *RayDance* does not save any of its custom objects in a form usable by other 3D software, though I was informed that version 1.1 will fix this and will be available as a free upgrade to registered users.

RayDance requires at least 1Mb of RAM and two floppy drives, though most rendering will require more RAM. An accelerator would be helpful – likewise a hard disk drive.



A fractal tree in a fractal world. What will they think of next?

SHOPPING LIST

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or Fish Disk 585

Raydance full version $99.95
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from Radiance Software

3D SCANNING

Many of the objects on the Imagine Objects disk are created by Viewpoint, from Utah USA, which scans in 3D. Impulse is now issuing additional object disks – Disk One is just out containing, among others, an Allosaurus dinosaur, a horse, an AH64 helicopter, a Mack truck and an A-10 Tankbuster aircraft, plus ships, cars, and anatomy objects, etc. These will retail for $129.95 in the US – keep your eyes open for them over here!

again there's been further improvement in rendering speed, even in the non-turbo version. I'm always impressed by Impulses' ability to squeeze more out of the program than before.

Imagine 2 is not just a facelift and a few bug fixes – it really does add more power to your elbow. Now, how does that car engine work....

You can E-Mail Gary Whiteley as drgaz@cix.compulink.co.uk.

more video overleaf

SHOPPING LIST

Imagine 2 .... £269
by Impulse, Inc.
8416 Xerxes Ave. North
Brooklyn Park, MN 55444 USA

Distributed in UK by:
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Ease of Use ●●●○○
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Features ●●●●○
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Documentation ●●●●○
Vastly improved.

Quality ●●●●○
Any output from 2 colour lo-res to 24-bit.

Price Value ●●●●○
A reasonably priced, high flying contender in the 3D stakes.

Overall rating ●●●●○

Imagine 2 might not be the easiest 3D program to use, but there are so many features, and so many options, that it's almost certainly one of the most flexible. I'm still impressed.

MAPMASTER & SURFACEMASTER

Gary Whiteley looks at MapMas and SurfaceMast new products wh promise to add new dimensions t your animations

So – you've bought your copy of *Imagine* and you're gearing up to produce some stunning 24-bit animations. You've got a great idea, and you've got all the objects ready to roll. Only – you just can't seem to work out how to make that glass look right, the chrome shine as it should or how to drape that background with the pattern of your dreams.

I'm not surprised, because it can be difficult getting to grips with all the possible of Attribute, Texture and Brush Mapping that *Imagine* offers. Even experienced users have gone through hell and high water exploring some of the more remote regions of *Imagine* in their search for buried treasure (gold, diamond and other attributes, I mean).

But despair no more – help is at hand. American Louis Markoya (a time-served and respected hand in the Amiga graphics community) has come up trumps with a couple of reference works which open up new worlds at the touch of a mouse.

MapMaster and *SurfaceMaster* are two separate packages designed not only to demonstrate the many possibilities which Imagine offers for putting the clout into otherwise lifeless objects, but also to provide you with some new attributes and images to experiment with and incorporate into your own work.

But first some technical stuff, as a few descriptions are in order for those who thought that maps were something that Boy Scouts got caught in their woggles.

As one of the leading 3D-modelling and animation programs for the Amiga, *Imagine* provides many facilities for producing marvellous looking objects. Some of the most important of these are more to do with how an object looks than what its actual shape is.

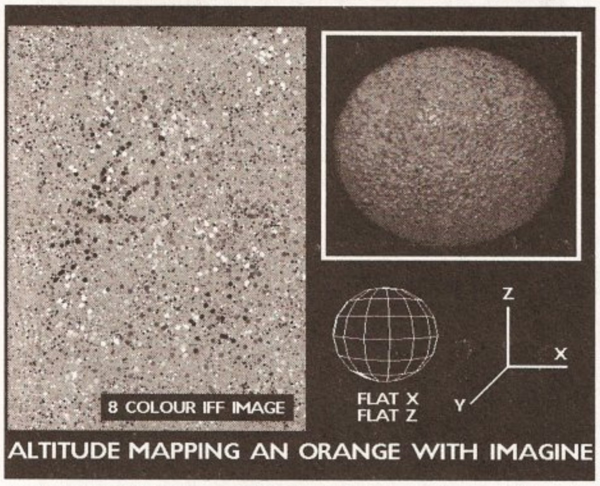
Think about it like this – you want a shiny chequered floor, gold fittings and a panoramic view from a window for the 3D palace you're building. Let's take the view first. In the real world the objects you see through a window have to actually exist, though you could use a picture window to obscure a particularly nasty view. In a computer 3D world it's possible to build all the objects which you will see through the window, but this is usually wasteful of both memory and rendering power, unless you're going to move outside the window at some point. The solution is to MAP a graphic image (perhaps a nice landscape) into the window area to provide the view. This is easily achieved by importing a suitable picture from a paint program or scanner and using it as a brush, hence the term Brush Mapping. The floor could be made by giving it a chequered surface texture (Texture Mapping), while the gold objects are produced by manipulating their Attributes (the properties which define the physical appearance of the object).

Another mapping example is that of an orange. If you were to try to model one you'd end up with a spherical shape covered with tiny dimples – an object composed of maybe thousands of points and polygons. Although it would look like an orange, such an object would use excessive amounts of memory and take much too long to model. This is where Altitude Mapping (or Bump or Elevation mapping) comes to the rescue. It works like this...

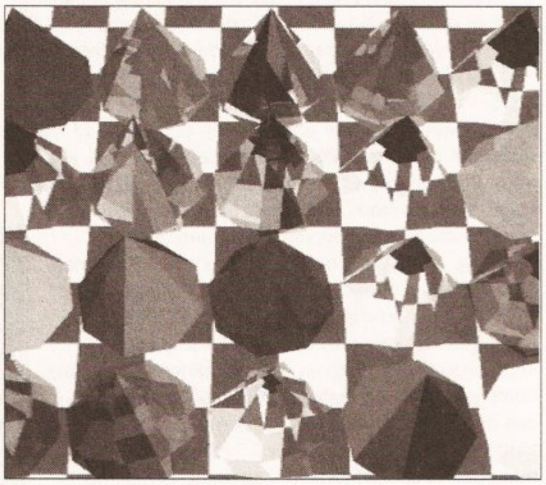
Use a paint program such as *Deluxe Paint* to make a grey scale IFF or brush image (16 colours or less will usually do). For the orange skin a colour cycled spray of dots ranging from dark grey to white on a plain background should suffice. Use this as an Altitude map to wrap over the surface of a simple orange coloured spherical object. The result will be a convincing looking orange which takes only a fraction of the time, effort and memory to produce than a modelled one. You can see the results in the illustration. By the way, this is also how details such as heads and tails are put on coins, and those flash looking backgrounds for television are produced.

Imagine has three ways of affecting how an object looks. First

continued on page 87



An illustrated How-to, courtesy of Dr Gaz. Make an IFF brush, wrap it on to an orange sphere as an Altitude (Bump) Map and Hey Presto! A mouth watering grey orange!



To show off all of *SurfaceMaster's* attributes I made a cone and copied it 24 times. I loaded a new attribute on to each of the cloned cones, leaving the last plain for comparison. To see any reflection and refraction effects I made a chequered floor (using Check Texture), and added 2 spherical white lights above the scene

• • • REQUIREMENTS • • •

To make full use of both *MapMaster* and *SurfaceMaster*, Impulse Inc's *Imagine* software is obviously required, though the slide shows will run on any Amiga with 1Mb of memory. Some of the *MapMaster* demos for *Imagine* will require up to 4Mb of memory to render. A hard drive and a turbo board would also help greatly.

3D POWER USERS

3D programs such as *Imagine, Real 3D, RayDance*, all benefit from having plenty of memory and a hard drive to load and save images with. Because rendering with 3D programs is tough on your computer's data processing department, it's often advisable to have an accelerator board as well, otherwise the poor old Amiga is continually tied up just producing pictures. This might seem a lot of extra hardware if you just have a plain Amiga 500 and are wondering whether to get into 3D animation, but I'm afraid that's the way it is. Producing quality, ray-traced images requires a lot of power and storage capacity. Take heart, you can still make great animations in lores HAM. Remember – it's not always the quality that counts. If the content stinks, it doesn't really matter how good the quality is - it's still going to flop.

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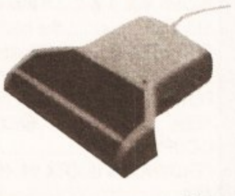
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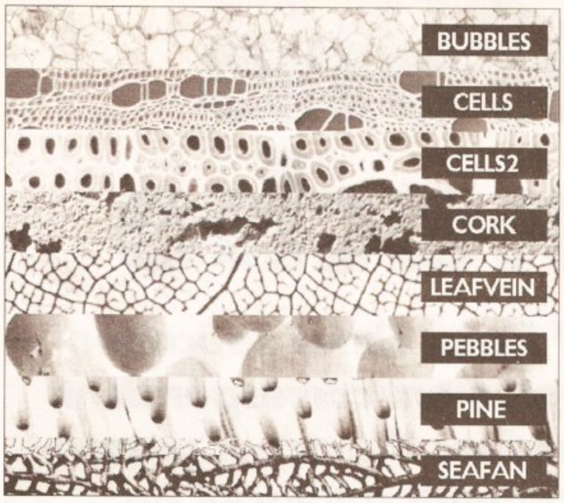
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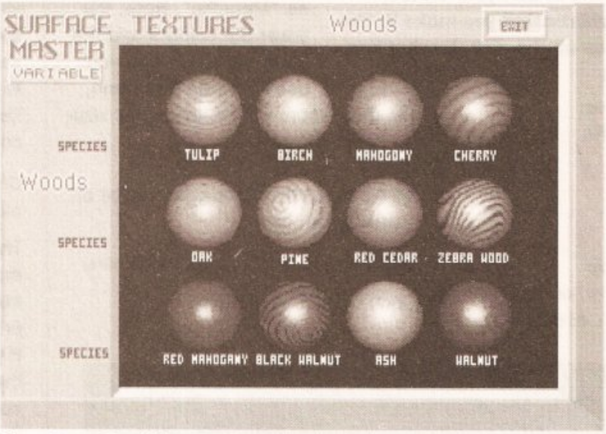


A glimpse of some of the 16 colour IFF images provided with *MapMaster*. They're all 640 x 400 grey scale images, so those of you reading in black and white needn't worry. Use 'em for brush mapping, but especially for Altitude mapping – they look superb

continued from page 84

there's Brush Mapping, which includes Colour, Filter and Reflection, as well as Altitude, and which allows a picture to be wrapped on to an object. Secondly there are the Attributes – combinations of Colour, Reflectivity, Specularity, Hardness, Roughness, Dithering and Shininess, as well as an Index of Refraction – which give an object the impression of being made of glass, metal, plastic, water, crystal or whatever. Thirdly there's Texture Mapping, which provides a way of making a textured looking surface by manipulating a predefined data file to give the impression of Bricks, Checks, Dots and so on. To add that final twist, it is possible to combine up to four textures, four images and one attribute for any single object!

MapMaster concentrates on the aspects of Image mapping, *SurfaceMaster* on Attributes and Texture mapping, but both have a common system for demonstrating how the various effects work… Interactive Slide Shows. These are collections of IFF images which show variations and combinations of the relevant subjects – Brush Mapping, Attributes or Texture mapping techniques – which are mouse-driven via point and click mini-picture menus. Both shows were put together using the Director program, but there's no need for you to have this in your software collection as a player is included. All you need do is click on the main icon, wait for the slide show to load, and choose your subject. *MapMaster* has 18 slides to select from, *SurfaceMaster* 15. One point, though – because the palettes have been optimised in the demos the images do not truly represent the full quality of *Imagine*'s output. Nevertheless, short of rendering the screens yourself (which is the recommended way to see results), the quality is very high and all the images are detailed and educational. Because they were rendered on an American NTSC Amiga there's a slight drawback in that the images are smaller than our normal UK screen sizes, but this certainly doesn't detract much from their usefulness.



How to make different woods by varying the colours and parameters of the *Imagine* Wood Texture

SURFACEMASTER

Zooming closer in on *SurfaceMaster* leads us to a single disk and a well written manual, with a commentary on all the images in the slide show, hints and tips on texture and attribute mapping and plenty of useful supplementary information.

The disk contains a set of around 20 new attributes, including chrome, steel, emerald and diamond, sets of objects for rendering quality versions of the demo slides with *Imagine*, and the slide show, as well as its player.

The demo images are of good quality, and cover a wealth of subjects concerning attribute settings and texture mapping. Everything from colour, reflection and filter settings to different wood and pebble textures are illustrated.

There is a batch of objects provided which include various examples of texture parameters. If you've had problems using any of *Imagine*'s textures (and who hasn't), these files provide handy pointers as to where you may have gone wrong.

MAPMASTER

MapMaster is the heavyweight of the pair, weighing in with three disks and manual containing hints, tips and guidance. Two of the disks are dedicated to IFF images for mapping, while the other holds the slide show, objects, and projects for *Imagine* to render. The demo images are of good quality, well laid out, and informative. On the whole I think I prefer *MapMaster*'s presentation, because the layout is better and slightly more interactive.

The IFF files are high quality, 16 colour grey scale images in 640 x 400 resolution (NTSC strikes again!). But size, as they say, isn't everything – these images wrap as well as any 640 x 512 PAL pictures. While grey scale images produce rather dull results with Colour Mapping, they are essential for the Reflection, Filter and Altitude mapping methods, which take the magnitude of their effects from the levels of white or black in the image. With Altitude Mapping pure white produces the most elevated areas, pure black the least. Reflection and Filter maps work in similar ways.

There's a variety of images provided, all from natural sources, from bubbles to reptile Skin. Curiously, once wrapped on to an object, it may be hard to tell what the original image was.

IN CONCLUSION

Imagine is a complex program offering a wealth of possibilities. These two volumes will provide help to novice and expert alike. They can't simply be read and absorbed, but will provide a jump start when you're stuck. Try out the supplied attributes, objects and textures, render some scenes. Learn, and you'll reap the benefits of *SurfaceMaster* and *MapMaster* in your future *Imagine* animations and images. AS

JARGON BUSTING • JARGON BUSTING

Brush wrapping – Wrapping an IFF image on to a 3D object to give it a new surface appearance.

Index of refraction – Light is bent as it passes from one transparent medium to another (eg from air to glass). The Index of Refraction is used to represent this relative deviation, with standard figures usually being used to represent glass, water, air, diamond etc. Higher Index values cause more bending and more reflectivity.

Dithering – A method of producing smoother colour graduations by mixing one colour with another to give the appearance of a third. Uses less colours (and less memory).

SHOPPING LIST

MapMaster........................ £54.00
SurfaceMaster £28.00
by Louis Markoya/Computer Imagery

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CHECKOUT SURFACEMASTER

Documentation ●●●●○
Good– maybe a little technical in places.

Ease of use ●●●●○
No problems here.

Teaching value ●●●●○
Lots of useful hints and tips here.

Price Value ●●●●○
Almost certainly worth the money.

Overall rating ●●●●○
See *Mapmaster* comment.

CHECKOUT MAPMASTER

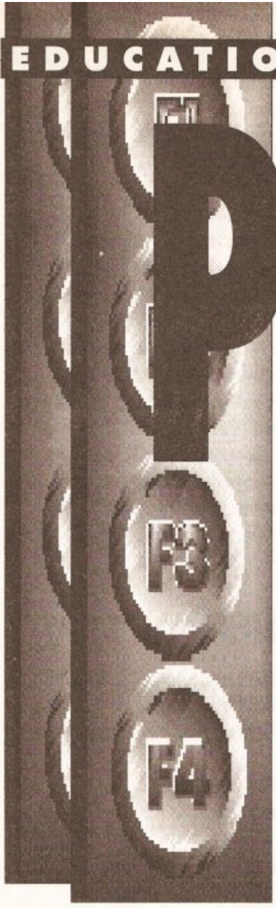
Documentation ●●●●○
Good, tries hard to explain some difficult ideas.

Ease of use ●●●●○
A cinch.

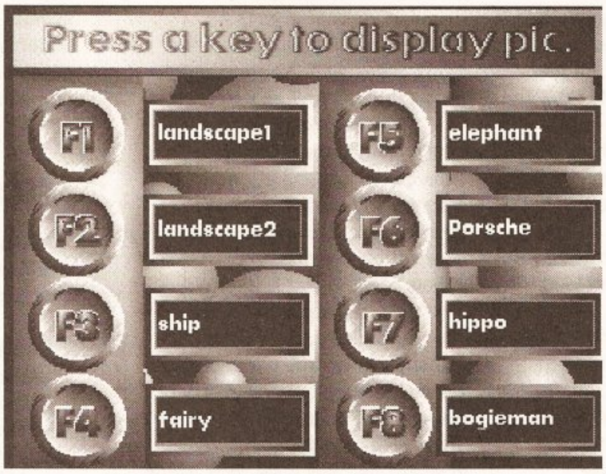
Teaching value ●●●●○
A great help in understanding some of *Imagine*'s obscurely explained, but wonderful, features.

Price Value ●●●●○
Bearing in mind what's included, not too bad at all.

Overall rating ●●●●○
Both packages provide invaluable help for the *Imagine* user, each with a wealth of in-depth knowledge to impart. The prices may seem steep, but there has obviously been a lot of work and research invested, and the time saved in experimentation would more than justify the expense.



Presentations with panache



You can design the menu to suit your tastes, although the more sophisticated you make it, the more memory it uses up on the disk, leaving less room for your pictures

Wilf Rees, Times Education Supplement correspondent, examines the art of presentation with a tutorial on how to make first impressions count. Plus, how Compendium Six could teach us a thing or two

The examination season looms. Panic is in the air; nail-biting is rife. It's easy at these times to forget the importance of presentation. Students, in a mad rush, concentrate on the content of their work, forgetting the form. Yet an attractively presented piece of work is likely to score significantly better in exams.

This month, I'm going to show how to present files in a way that conveys the impression of caring about your work. It isn't peculiar to examination work, but just a way to collect your efforts so that they have a touch of class.

SELL YOURSELF

More and more students are using Amigas to develop work for exams, and when I pick up a disk to see what's been offered, I meet a myriad of approaches to accessing the data.

With all the hassle that marking entails, grief in trying to get at the data is something we can do without. The old saying of: "First Impressions" still carries clout.

The following procedures will demonstrate how to make a menu to present IFF files and call them up at the touch of a key. Read through the commands carefully, and ensure you input them as they are written, remembering to avoid spaces or typing errors. The DOS commands do work if followed accurately.

❶ First of all, boot up your Workbench disk and format a blank disk. Relabel it to "Pictures". Then open a Shell window and type the following :

```
copy c:install to ram:
```

Then put the disk in df0:

```
ram:install df0:
makedir pictures:s
makedir pictures:c
makedir pictures:l
makedir Pictures:devs
Makedir Pictures:devs/keymaps
copy Workbench:c/run Pictures:c/
copy Workbench:system/setmap ↵
Pictures:c/
```

These commands set up a disk with the files to work, but unless you have a second disk drive, this process involves a lot of disk swapping!

❷ Next you need to create a menu, using an IFF art package. A simple idea would be a series of illustrations of function keys, followed by the pictures' names. Save this on to the disk as "MenuPic". Note: the fewer the colours and the lower the resolution you use to create the menu, the more room will be left on the disk to display pictures.

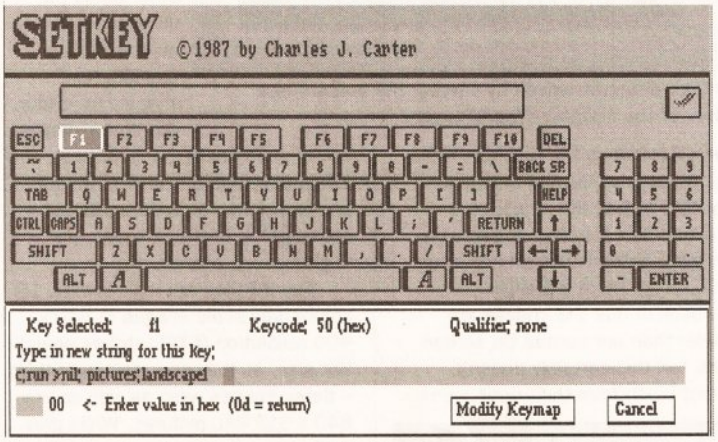
❸ Now edit the startup-sequence of that disk, so type:

```
Ed Pictures:s/startup- sequence
```

Once Ed is loaded, type:

```
c:run >nil: c:showfiles ↵
Pictures:menupic
Setmap MenuMap
```

Press <Esc.> x <Return> to save the file. The commands you have just entered into the startup-sequence make the computer run the commands. Each line is a new command; the first tells the computer to show the menu using an IFF file viewer program, the second to load a keymap for menu selection.



Here is an example of a keymap editing program, *Setkey*. This program enables programming of any key to produce a series of characters

❹ Now edit the keymap to run the viewing program, thus displaying selections from your menu screen. A keymap editor program will allow you to change key settings to suit the keys displayed in the menu. You could enter this:

```
C:run >nil: c:showfiles ↵
pictures:iffPictureFILE
```

There are utilities that facilitate the modification of a keymap, for instance, the mouse speed-up program, *Zoom* or *MightyMouse*. If you manage to find a program that saves the information that you put into it as a keymap file, then the line: Setmap MenuMap would be relevant as you would save the keymap file into the Devs:keymaps/ directory of your disk, under "MenuMap."

If the program saves a datafile in the S: directory of a disk, for example the mouse speed-up (and utility) program, *Zoom*, you would replace the line "Setmap MenuMap" in your startup-sequence to read something like this:

```
Run >nil: c:zoom s:zoom.config
```

❺ Next copy all the pictures you wish to show on to that disk. Remember, you can only show the files that you have specified the keymap to display. If you do not have any form of keymap editor, you could rename the iff files with numbers:

```
Rename pictures:↵
landscapepic.iff pictures:1
Rename pictures:↵
junglescene.iff pictures:2
```

Your menu would need to include the relevant keys to press. For instance your menu could display:

```
To view Landscape.pic, ↵
press "1" then return
```

You would also have to remove the following line from the startup-sequence to tell the computer not to set a new keymap:

```
Setmap MenuMap
```

Now select your favourite iff file viewer, and copy it on to the disk. Here is an example:

```
Copy <Path>:<fileshowername> ↵
to pictures:c/showfiles
```

Some choices for file showers are: vilbm, mostra, ppshow show, superview and Display (the one on the new Workbench 2.04 disks) With a bit of luck, the documentation on the syntax of these programs will be available for reference. Some of them do require certain files in the LIBS: directory of your disk. To create a LIBS: directory on your disk, type the following into shell:

```
Makedir Pictures:libs
```

If the IFF viewer requires the iffparse.Library you will need to copy that, so type from Shell:

```
Copy libs:iffparse.library to ↵
pictures:libs
```

Other possible libraries that a program may need are the iff.library or the arp.library.

Your own menu pic shower disk is then complete. Creating different menu screens according to the nature of the included files will also convey the impression of slickness.

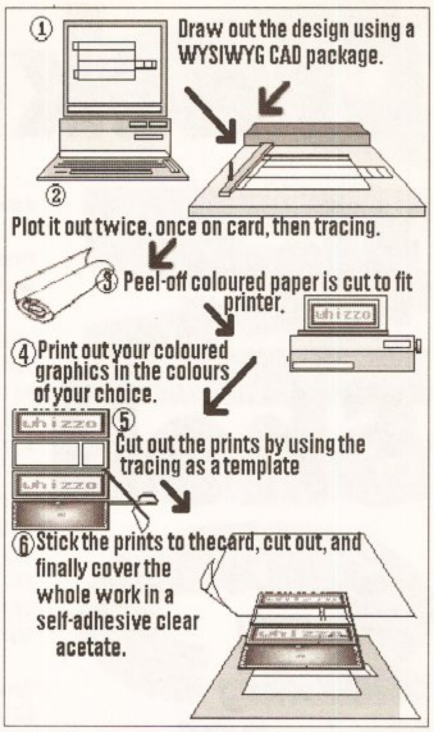
LITTLE BOXES MADE OF TICKY-TACKY

Graphic design often requires some form of model to demonstrate the solution to a packaging project. With a little time and effort, it is possible to make these mock-ups look professional, and I want to share a few tricks to help you make them look better.

Working through a design brief, it's easiest to rough out ideas on paper, but when you have decided on your design, the Amiga can help you to sharpen up your presentation.

WYSIWYG

Firstly we use a CAD package which gives you WYSIWYG. Most CAD packages offer this. You need to spend time working out the "NET", or "DEVELOPMENT" of your packaging, so that the it appears to be opened out flat on the screen. Remember to give thought as to how the box is going to join together, so you will need some additional tabs or strips to enable gluing to be carried out. Complete the drawing up of the 'net' and dump the drawing on to white card using a plotter. When the dump is complete, carry out a second dump, this time on to detail or tracing paper. This will allow you to overlay the tracing on top of the original card plot. Each facet of the packaging can now be identified as a single or multiple side.



A step-by-step guide to creating perfect product packaging

NO NAFF CAD FONTS!

At this stage quality often begins to fall down. You can use fonts from the CAD package, let's be a little more adventurous...

Most stationers sell coloured, or white peel-off sticky-backed paper. Despite what printer manufacturers say, I've been using this for years and it works perfectly, so, get hold of *Dpaint*, and design the packaging exterior as you want it, and print out on to the peel-off paper. The benefit of the tracing that we did on the plotter, is that we can overlay it on to the printout on the peel-off paper in colour, and mark out and cut the graphics to fit the 'net' on the white card. Remember to score the card before sticking on the graphics. For the pro finish, cover with sticky-back plastic. You'll find really professional looking models can be achieved. AS

JARGON BUSTING • JARGON BUSTING

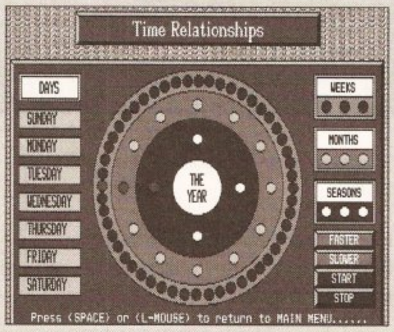
Keymap – a file that is usually found in the DEVS:keymaps/ directory of a disk, containing all the information about what happens when a certain key is pressed, ie function key one (F1) may print the following into the cli window when pressed:

```
dir df1: all
```

A keymap is loaded by typing Setmap <keymap>. No path for the keymap is required.

SIX OF THE BEST

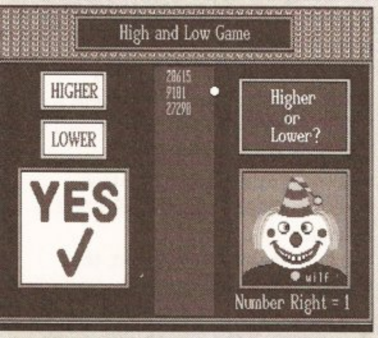
COMPENDIUM SIX is a suite of six programs which are aimed at the 5 to 15 age group. In bundling this group together, Genisoft has brought together a well thought out grouping at an incredibly low price. Briefly, the separate programs, each on its own disk, are; *Kids Type* – an elementary word-processor tutor; *Weather Watcher* – a meteorological database/graphics utility; *Calendar Quiz* – a time/spelling/diary function; *Words & Numbers* – a grammar and number program; *Game Set & Match* – geometric, number, sequence, relationships and reaction tester and *Where is it, What is it?* – counties in the UK taught by options of shape, location and jigsaw.



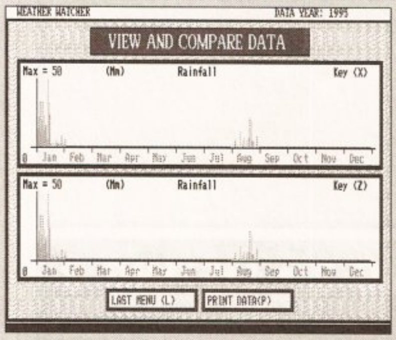
***Calendar Quiz* takes an interesting approach to the teaching of the days, weeks and months of the year along with a built-in quiz to test understanding as you go along**



***Where is it, What is it?* tests different ways of testing knowledge of the location, shape or names of counties in the British Isles. I never realised I knew so few!**



***Game Set and Match* is a package which looks at remembering sequences in both shapes and numbers, and then repeating them. It was fine in the early stages, but it soon got harder**



***Weather Watcher* allows statistics on all manner of meteorological characteristics to be displayed in assorted ways. Above: rainfall statistics over the duration of a year**

Now, it wouldn't be unusual to see any of these packages offered as an individual unit, and selling for around £30. What I think is amazing is that the whole suite is available for just £35!

The set of programs are supported by an adequate manual, brief in its descriptions, yet sufficient to enable even the most inexperienced of Amiga users to get by without too much difficulty. It is not often that I get enthusiastic about an educationally oriented package, but I think *Compendium Six* warrants it. It is often the case, that in setting out to convey an educational principle or procedure, that educational software becomes blinkered in its overall performance, usually at the expense of presentation, friendliness, or stability. Not so this package. Each of the programs uses graphical presentation in an imaginative way, is very easy to use, and works flawlessly. Each is commendable for assorted reasons, but as a package, which brings together an assortment of some previously released software, and some new, this bundle is excellent.

Compendium Six is available from HB Marketing 0753 686000 for £34.95

Cracking the Shell

Yet more ground-breaking AmigaDOS routines from Mark Smiddy this month with intelligent script files and extra database extensions

Last month's Cracking the Shell introduced the first part of a digital diary with the initial calendar module and the first part of the telephone and address database. This month's module is the search routine which will search for and display any sub-string which is found in the database.

As an added bonus, this month's Master Class features a special script unlike anything ever attempted before. It will search any AmigaDOS program and produce a list of the commands which need to be made resident. (You can use IntelliRes on the Database programs if you wish; I have not used it here in order to save space.)

When you have entered the FindData module, your database will work like this:

```
(A)dd a record
(D)elete records [Start @ ↲
#][End @ #)]
(V)iew records [Start @ ↲
#][End @ #]
(F)ind a record [Search ↲
string]
(E)dit database directly
(S)ort database [Column #]
(L)ist entries by number
(P)rint database
(Q)UIT

Command: F Smiddy
12 Mark Smiddy, Amiga ↲
Shopper, 30 Monmouth Street,↲
BATH
```

If you enter F on its own followed by Return, you will be prompted for a search string, viz:

```
Command: F
search string: Smiddy
12 Mark Smiddy, Amiga ↲
Shopper, 30 Monmouth Street,↲
BATH
```

This can contain up to nine words separated by spaces; and can be used to narrow the search down.

Note: although patterns are available in AmigaDOS 2's search command, they are not supported by the module.

HOW IT WORKS: FINDDATA

The FindData module (shown in Listing 4) is called from the main Database script like this:

```
execute s:FindData {option}
```

and, as you may remember, the option variable is built from the list of key variables.

This effectively passes a command line (search string) to the script if the user specified one. The rest is handled by the module as follows:

1. This key can collect up to 13 items of data, although it will usually only pick one or two. The first item found is dumped in <a1>, the next in <a2> and so on.

2. Collects the data together in a single variable <data>.

Table 1: LIST's LFORMAT Strings

Insert this:	To get this:
%S	Filename
%S.%S	Path.Filename
%S.%S.%S	Path.Filename.Path
%S.%S.%S.%S	Path.Filename.Path.Filename

3. Tests for the presence of an argument string. You may wonder why the collected variable, <data> wasn't used here and true enough the reason is not immediately apparent.

In fact, <data> is a collection of variables separated by spaces.

If no data was supplied, <data> will still contain spaces, thus fooling IF into thinking that some data has in fact been supplied. This is not true of <a1> because all the excess spaces are removed by EXECUTE's command line parser. Or in other words, don't worry, it just works that way.

4. Control will reach here if a blank command line was specified and then immediately jumps to Step 19.

5. Closes the IF...ENDIF construct opened at Step 3.

Control only reaches here when a command line search string was supplied.

6. This is a bit of extra redundancy. It prevents the script from crashing if the data file is missing for some reason. In this were to be the case, control would jump to Step 11; ordinarily it proceeds to Step 7.

7. Using the search command, this attempts to locate the search string within the data file.

(Note: the search string is surrounded by quotes to prevent a blank string confusing the parser.) If matching data is found, it is displayed with a corresponding record number and the WARN flag is cleared.

If no matches are found, the WARN flag is set, which is tested...

8. ...here. If the search string was found, control jumps to Step 10. Otherwise it continues at Step 9 and...

continued on page 94

LISTING 1 • LISTING 1 • LISTING 1

INTELLIRES

```
.key script/a
.bra {
.ket }
copy "{script}" T:SearchMe
echo >T:ResIt "Resident c:Resident"
echo "Searching {script}*nPlease wait..."
list >T:AutoRes c: lformat ";%s*nsearch >NIL: T:↲
SearchMe *"%s *" *nif not warn*necho >>T:ResIt ↲
*"Resident %s%s*"*nendif"
execute T:AutoRes
echo "Command file now available in T: as the ↲
following:"
type T:resit
```

LISTING 2 • LISTING 2 • LISTING 2

AUTORES

```
;C:
search >NIL: T:SearchMe "Dir "
if not warn
echo >>T:ResIt "Resident C:Dir"
endif
[etc.]
```

LISTING 3 • LISTING 3 • LISTING 3

RESIT

```
Resident C:Resident
Resident C:Search
Resident C:Type
[etc.]
```

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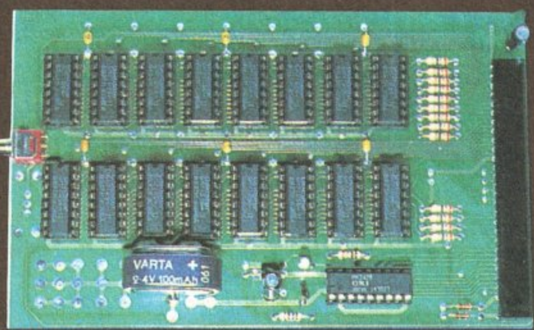
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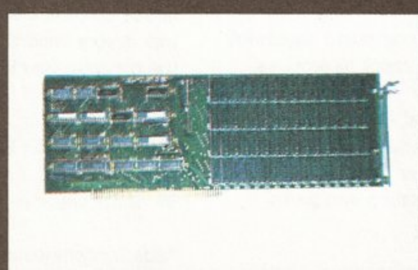
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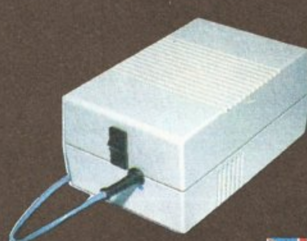


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• HERE'S SMIDDY'S RED HOT TIP •

AmigaDOS 2 has a lot of hidden features and a new one in VERSION 2.04 is the date string. Using this you can not only retrieve a command's version number, but also the on which it was compiled! Here's how it works:

Synopsis: VERSION [NAME] [REVISION] [UNIT] [FILE] [INTERNAL|RES] [FULL]
Template: VERSION NAME, REVISION, UNIT, FILE/S, INTERNAL/S, RES/S, FULL/S

By default, VERSION just returns the Workbench and Kickstart versions:

```
1>VERSION
Kickstart version 37.175. Workbench version 37.67
```

To get the version of any command you would use this:

```
1>VERSION C:DIR
dir 37.5
```

Now add the FULL switch to get the date too…

```
1>VERSION C:DIR FULL
dir 37.5 (4.6.91)
```

If the command is resident, you must specify INTERNAL or RES on the command line.

```
1>VERSION LAB INTERNAL FULL
Shell 37.69 (22.5.91)
```

The file switch does not appear to have any effect in the current release. I suspect it is supposed to force a search for a file, which is default anyway.

You can test for specific versions of libraries etc with the warn flag as this script fragment demonstrates:

```
VERSION LIBS:diskfont.library version=37
IF WARN
 Echo "wrong version of diskfont library"
ENDIF
```

This checks for the Workbench 2 DiskFont library. Checking for a specific revision does not work correctly.

You might like to prove this for yourself; the following should display "Wrong version…" (diskfont is revision 58 in the current release) but it doesn't:

```
VERSION LIBS:diskfont.library version=37 revision=57
IF WARN
 Echo "wrong version of diskfont library"
ENDIF
```

Note: this command is case sensitive. DISKFONT.Library will not work.

continued from page 90

9. …prints a short message to the effect of: the search string could not be found.

As you can see the search string is enclosed in escaped quotes to show the exact contents of the search.

10. Closes the IF…ENDIF construct opened at Step 8.

11. Closes the IF…ENDIF construct opened at Step 6.

12. Is the jump point used when an empty command string is found at Step 3. If control reaches here from Step 11, the command is ignored.

13. Inserts a blank line (*n) and waits for the user to enter Y or press Return. Entering Y <Return> sets the WARN flag; it is cleared otherwise.

14. If the user entered Y, control resumes at Step 15, otherwise it jumps to Step 16.

15. The user wants to execute another search, so control is passed to Step 19.

16. If control gets here from Step 15, it branches to Step 18; otherwise it continues at Step 17.

17. Control only reaches here if the user did not enter Y at step 14. In other words, they want to return to the main program.

18. Closes the IF…ELSE…ENDIF construct opened at Step 14.

19. Marks the jump from Step 15.

20. Displays the command prompt. This is only displayed when a search string was not specified *or* a successive search has been requested.

21. Calls the FindData script again recursively and places it in interactive mode. The command line argument string is sunk to NIL and not displayed. This technique was demonstrated last month in the main Database module.

AFORE YE GO…

And now, the end is near and as we raise the final curtain on AmigaDOS for this month, I can reveal that next month I'll be giving away the rest of the AmigaDOS database so you'll be able to use the it without restriction.

Until then, don't forget you can still use ED to add and delete records so you never need lose a telephone number or miss an appointment again. (*Perhaps you can use it to keep a track on your deadlines Mark*, Ed.) AS

LISTING 4 • LISTING 4 • LISTING 4

FINDDATA

```
1. .key a1,a2,a3,a4,a5,a6,a7,a8,a9,aa,ab,ac,ad,data/k
2. .def data "<a1> <a2> <a3> <a4> <a5> <a6> <a7> <a8> <a9>
<aa> <ab> <ac> <ad>"

3. if "<a1>" EQ ""
4. skip FindOne
5. endif

6. if exists S:Data
7. search S:Data <data>
8.  if warn
9.   echo "*"<data>*" not found"
10. endif
11. endif

12. LAB again

13. ask "*nSearch again y/N"
14. if warn
15. skip FindOne
16. else
17. execute S:database
18. endif

19. LAB FindOne
20. echo "search string: " noline
21. execute >NIL: s:FindData ?
```

JARGON BUSTING • JARGON BUSTING

Script – Meta-AmigaDOS command, built from other AmigaDOS commands. More usually referred to as a batch file on other systems.

String – A variable holding alphanumeric data, as opposed to numbers. Each item is a character; all of these are strung together in the variable.

GOTTA PROBLEM?

If you get stuck with AmigaDOS or there is anything specific you would like to see covered here, drop a line detailing your conundrum to: Mark Smiddy, Amiga Shopper, 30 Monmouth St, BATH, BA1 2BW. Sorry, no personal correspondence can be entered into. You can EMail me on CIX @ SMIDOID.

• HERE'S SMIDDY'S RED HOT TIP •

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13. Inserts a blank line (*n) and waits for the user to enter Y or press Return. Entering Y <Return> sets the WARN flag; it is cleared otherwise.

14. If the user entered Y, control resumes at Step 15, otherwise it jumps to Step 16.

15. The user wants to execute another search, so control is passed to Step 19.

16. If control gets here from Step 15, it branches to Step 18; otherwise it continues at Step 17.

17. Control only reaches here if the user did not enter Y at step 14. In other words, they want to return to the main program.

18. Closes the IF...ELSE...ENDIF construct opened at Step 14.

19. Marks the jump from Step 15.

20. Displays the command prompt. This is only displayed when a search string was not specified *or* a successive search has been requested.

21. Calls the FindData script again recursively and places it in interactive mode. The command line argument string is sunk to NIL and not displayed. This technique was demonstrated last month in the main Database module.

AFORE YE GO...

And now, the end is near and as we raise the final curtain on AmigaDOS for this month, I can reveal that next month I'll be giving away the rest of the AmigaDOS database so you'll be able to use the it without restriction.

Until then, don't forget you can still use ED to add and delete records so you never need lose a telephone number or miss an appointment again. (*Perhaps you can use it to keep a track on your deadlines Mark*, Ed.) AS

LISTING 4 • LISTING 4 • LISTING 4

FINDDATA

```
1. .key a1,a2,a3,a4,a5,a6,a7,a8,a9,aa,ab,ac,ad,data/k
2. .def data "<a1> <a2> <a3> <a4> <a5> <a6> <a7> <a8> <a9>
<aa> <ab> <ac> <ad>"

3. if "<a1>" EQ ""
4. skip FindOne
5. endif

6. if exists S:Data
7. search S:Data <data>
8.  if warn
9.   echo "*"<data>*" not found"
10. endif
11. endif

12. LAB again

13. ask "*nSearch again y/N"
14. if warn
15. skip FindOne
16. else
17. execute S:database
18. endif

19. LAB FindOne
20. echo "search string: " noline
21. execute >NIL: s:FindData ?
```

JARGON BUSTING • JARGON BUSTING

Script – Meta-AmigaDOS command, built from other AmigaDOS commands. More usually referred to as a batch file on other systems.

String – A variable holding alphanumeric data, as opposed to numbers. Each item is a character; all of these are strung together in the variable.

GOTTA PROBLEM?

If you get stuck with AmigaDOS or there is anything specific you would like to see covered here, drop a line detailing your conundrum to: Mark Smiddy, Amiga Shopper, 30 Monmouth St, BATH, BA1 2BW. Sorry, no personal correspondence can be entered into. You can EMail me on CIX @ SMIDOID.

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Tilt + swivel stand for Philips 8833	12.99
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As above, plus flicker fixer for A1500/2000	369.99

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New GVP 530 Drive	POA
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A590 20MB HD + 2MB	325.99
A590 52MB HD	399.99
A500 GVPII 52MB HD, exp to 8MB	358.99
A500 GVPII 10MB HD, exp to 8MB	525.99
A1500/2000 GVP II controller, exp to 8MB + Quantum 52MB HD	285.99
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Mastering MIDI

Paul Overaa continues his MIDI trail with some more Basic oriented discussions

This month, as promised, I want to look at MIDI data collection from Basic. Before getting stuck into some example code however there are a number of related general issues to contend with...

MIDI data arrives at the serial port as a series of byte (8-bit) values and, on the face of it, a program simply has to read a byte as it arrives, use it, and then loop back to collect another byte ad infinitum.

In practice this approach turns out to be far too simplistic because it totally disregards the fact that any given MIDI byte that arrives is likely to be logically related to either preceding and/or succeeding bytes.

In short, any MIDI program which is going to do anything useful with the incoming data must be able to both recognise and distinguish between all of the various classes of MIDI information. That means recognising status and data bytes, being able to cope with real-time messages, and possibly running status as well.

This means, of course, that a program which is to read and use MIDI data is likely to have to recognise the complete logical structure of the MIDI standard even if it is only interested in using one or two message classes (it is often the case that other classes need to be identified, so that they can be safely ignored).

To see the type of problems a MIDI reader program faces place yourself in the same position as you look at these six hex numbers...

91... 4D... 40... 91... 4D... 0...

91 hex is a note-on status byte. This tells us that two more data bytes (specifying the note and the velocity values) are going to arrive. With the above example the respective data bytes, 4D and 40, complete the message. The 91 value of the fourth byte tells us that the second note-on message is arriving and the 4D and 0 values tell us that this message is actually going to turn a note off.

In analysing those six bytes we had to look for status bytes and had to identify the messages being dealt with so that we could tell how many data bytes the messages would contain. If you repeat the analysis with a stream of numbers containing the odd real-time message thrown in, or a stream that is employing running status (ie the use of implied status bytes), you'll appreciate the analysis needs to be carefully controlled.

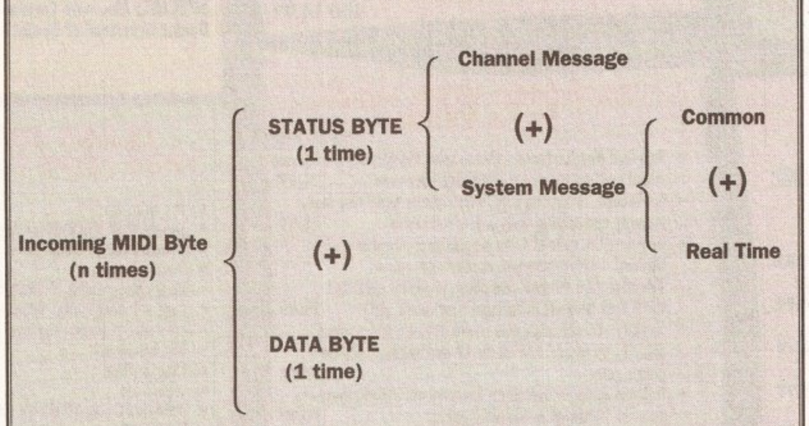
MIDI HIERARCHY

At the top of the hierarchy comes the status-byte/data-byte division and luckily this is simple to deal with. Incoming bytes are either status bytes or data bytes, never both (the left-most bracket of figure 1 shows this situation diagrammatically and the (+) sign is being used to indicate that the STATUS BYTE and DATA BYTE entries are mutually exclusive, ie any given byte is either a status byte *or* a data byte).

MIDI status bytes can be categorised in exactly the same sort of way and, again, figure 1 illustrates the hierarchy whilst figure 2 shows the categories that must be dealt with for channel message analysis.

MIDI System messages, as we

Figure 1: Basic divisions within the MIDI hierarchy



LISTING 1 • LISTING 1 • LISTING 1 • LISTING 1

```
DIM CHANNEL.MESSAGE$(112)
CHANNEL.MESSAGE$(0)    = "Note Off"
CHANNEL.MESSAGE$(16)   = "Note On"
CHANNEL.MESSAGE$(32)   = "Poly Key Pressure"
CHANNEL.MESSAGE$(48)   = "Control Change"
CHANNEL.MESSAGE$(64)   = "Program Change"
CHANNEL.MESSAGE$(80)   = "Channel Pressure"
CHANNEL.MESSAGE$(96)   = "Pitch Bend"
CHANNEL.MESSAGE$(112)  = "System Message"

OPEN "SER:" FOR INPUT AS #1 LEN=1
forever=1
WHILE forever
  x = ASC(INPUT$(1,1))
  IF (x AND &H80) THEN GOSUB STATUS.BYTE ELSE GOSUB
DATA.BYTE
WEND
CLOSE 1
END

STATUS.BYTE:
  IF (x<&HF0) THEN GOSUB CHANNEL.MESSAGE ELSE GOSUB
SYSTEM.MESSAGE
RETURN

CHANNEL.MESSAGE:
channel = (x AND &HF)+1
status = x AND &H70
PRINT CHANNEL.MESSAGE$(status);" on channel ";channel
RETURN

SYSTEM.MESSAGE: RETURN

DATA.BYTE: RETURN
```

JARGON BUSTING • JARGON BUSTING

Arrays – A grouping of variables, all called by the same name. The individual elements of the array are distinguished by a trailing integer number.

MIDI – Musical Instrument Digital Interface is a standard devised by electronic instrument manufacturers, allowing a number of synthesisers to be controlled by a single keyboard or sequencer.

Real time – Data is altered as it occurs rather than when it is residing in the memory of the computer.

saw in issue 11 (instalment 5), comprise of a number of system common messages and a set of real-time messages. The categories are shown diagrammatically in figures 3 and 4 and the only thing we need to be aware of in respect of real-time messages is that, because they are time critical, they can actually be inserted between the bytes of other MIDI messages (another complication for your program to deal with).

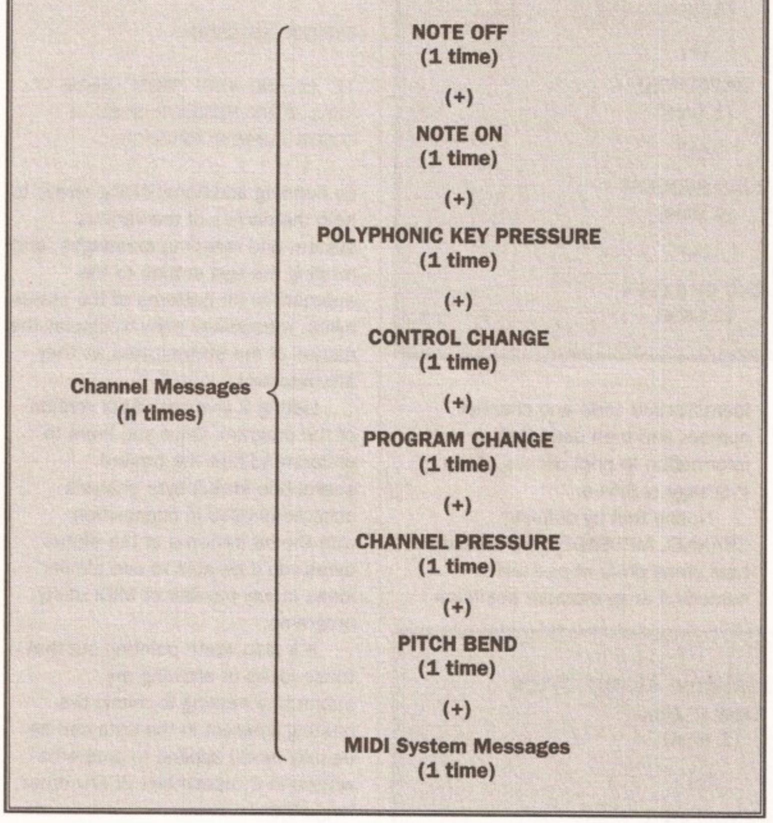
In all of the diagrams I have deliberately followed the same status byte ordering as used in issue 11 so you should be able to relate

FIRST STEPS IN REAL CODE

Using the serial device (SER:) from Basic is, as we saw last month,relatively easy providing you remember that Preferences needs to be used to set suitable serial port characteristics (namely a baud rate of 31250 with no parity, no handshaking, and just one stop bit).

To collect serial data using AmigaBasic, or any other Microsoft flavoured Basic come to that, requires that you open a sequential file for 'input' using a statement such as...

Figure 2: Part of the status byte hierarchy



the various classes mentioned to the status byte bit values mentioned in that earlier instalment.

I'm not going to plod on through a complete analysis of MIDI's logical arrangements because that takes us away from MIDI and too far into the realms of program design.

What I really want to do is use these outline discussions, coupled with what we learnt about status bytes in issue 11, to create a simple Basic 'MIDI status byte analyser' program.

This is not going to be a 'state of the art offering', and it is not going to handle the large number of subclasses of controller messages which exist. Nevertheless it will provide a useful starting point for further experiments and provide a piece of code that will be able to be used for a number of diagnostic purposes.

```
OPEN "SER:" FOR INPUT AS ↵
#1 LEN=1
```

Data collection could be done by reading bytes one at a time using Basic's INPUT$() statement like this...

```
x$=INPUT$(1,1)
```

but normally it's more convenient to collect the value as a number rather than in string form, so we would opt for the combined use of the ASC() function to produce this input line...

```
x=ASC(INPUT$(1,1))
```

Using this collection statement in conjunction with a loop arrangement will allow us to collect as much data as we want. To collect one hundred MIDI bytes we might use something along the lines of...

LISTING 2 • LISTING 2 • LISTING 2 • LISTING 2

```
DIM CHANNEL.MESSAGE$(112)
DIM COMMON.MESSAGE$(7)
DIM REAL.TIME.MESSAGE$(15)
CHANNEL.MESSAGE$(0) = "Note Off"
CHANNEL.MESSAGE$(16) = "Note On"
CHANNEL.MESSAGE$(32) = "Poly Key Pressure"
CHANNEL.MESSAGE$(48) = "Control Change"
CHANNEL.MESSAGE$(64) = "Program Change"
CHANNEL.MESSAGE$(80) = "Channel Pressure"
CHANNEL.MESSAGE$(96) = "Pitch Bend"
CHANNEL.MESSAGE$(112) = "System Message"
COMMON.MESSAGE$(0) = "System Exclusive"
COMMON.MESSAGE$(1) = "MIDI Time Code"
COMMON.MESSAGE$(2) = "Song Position Pointer"
COMMON.MESSAGE$(3) = "Song Select"
COMMON.MESSAGE$(4) = "Undefined"
COMMON.MESSAGE$(5) = "Undefined"
COMMON.MESSAGE$(6) = "Tune Request"
COMMON.MESSAGE$(7) = "End of System Exclusive
REAL.TIME.MESSAGE$(0) = "Timing Clock"
REAL.TIME.MESSAGE$(1) = "Undefined"
REAL.TIME.MESSAGE$(2) = "Start"
REAL.TIME.MESSAGE$(3) = "Continue"
REAL.TIME.MESSAGE$(4) = "Stop"
REAL.TIME.MESSAGE$(5) = "Undefined"
REAL.TIME.MESSAGE$(6) = "Active Sensing"
REAL.TIME.MESSAGE$(7) = "System Reset"

OPEN "SER:" FOR INPUT AS #1 LEN=1
forever=1
WHILE forever
  x = ASC(INPUT$(1,1))
  IF (x AND &H80) THEN GOSUB STATUS.BYTE ELSE GOSUB
DATA.BYTE
WEND
CLOSE 1
END

STATUS.BYTE:
  IF (x<&HF0) THEN GOSUB CHANNEL.MESSAGE ELSE GOSUB
SYSTEM.MESSAGE
RETURN

CHANNEL.MESSAGE:
channel = (x AND &HF)+1
status = x AND &H70
  PRINT CHANNEL.MESSAGE$(status);" on channel ";channel
RETURN

SYSTEM.MESSAGE:
  IF (x AND &H8) THEN GOSUB REAL.TIME.MESSAGE ELSE GOSUB
COMMON.MESSAGE
RETURN

REAL.TIME.MESSAGE:
  PRINT REAL.TIME.MESSAGE$(x AND 7)
RETURN

COMMON.MESSAGE:
  PRINT COMMON.MESSAGE$(x AND 7)
RETURN

DATA.BYTE: RETURN
```

```
FOR i = 1 to 100

x=ASC(INPUT$(1,1))
```

do something with the value in x

```
NEXT i
```

another simple scheme which could be used to continuously collect MIDI data is this...

```
forever=1

WHILE forever

x=ASC(INPUT$(1,1))

do something with the ↵
value in x

WEND
```

When collecting MIDI bytes the first decision that will need to be made as each byte of information is received is whether it is a status byte or a data byte. This involves testing bit7 and what I have chosen to do is use the results of such tests to select between two subroutines like this...

```
IF (x AND &H80) THEN GOSUB ↵
STATUS.BYTE ELSE GOSUB ↵
DATA.BYTE
```

This line of code will distinguish between a status byte and a data byte. However, if a byte turns out to be a status byte then we'll need to know whether it is a channel status byte or a system message.

As we saw in issue 11, a 1111 bit pattern in the upper part of the status byte signifies a system message and so this further test can be made...

```
IF (x<&HF0) THEN GOSUB ↵
CHANNEL.MESSAGE ELSE GOSUB ↵
SYSTEM.MESSAGE
```

What I am doing in this example is identifying the various MIDI message classes and, on the basis of the results, I'm selecting particular subroutines which will carry out the processing associated with a particular class.

The subroutine which receives channel message status bytes might isolate the channel and specific channel message class by using this type of bit-orientated code...

```
channel = (x AND &HF)+1

status = x AND &H70
```

do something with this data

The easiest way to see how this subset/subroutine correspondence helps in practice is to put all the pieces together into a runable program and this is exactly what listing 1 provides. A 'forever' loop is used to collect the MIDI bytes, status bytes are identified as either channel or system bytes and all channel byte values are sent to a routine which extracts their identification code and channel number and then uses that information to print details of the message received.

Notice that by defining CHANNEL.MESSAGE$(), a message type string array whose used numerical array element positions correspond to the bit contents of the upper four bits of the message classes, I've made it easy to do the conversion from message class bit pattern to printed message class text name.

Figure 3:
Diagrammatic form of the system common categories

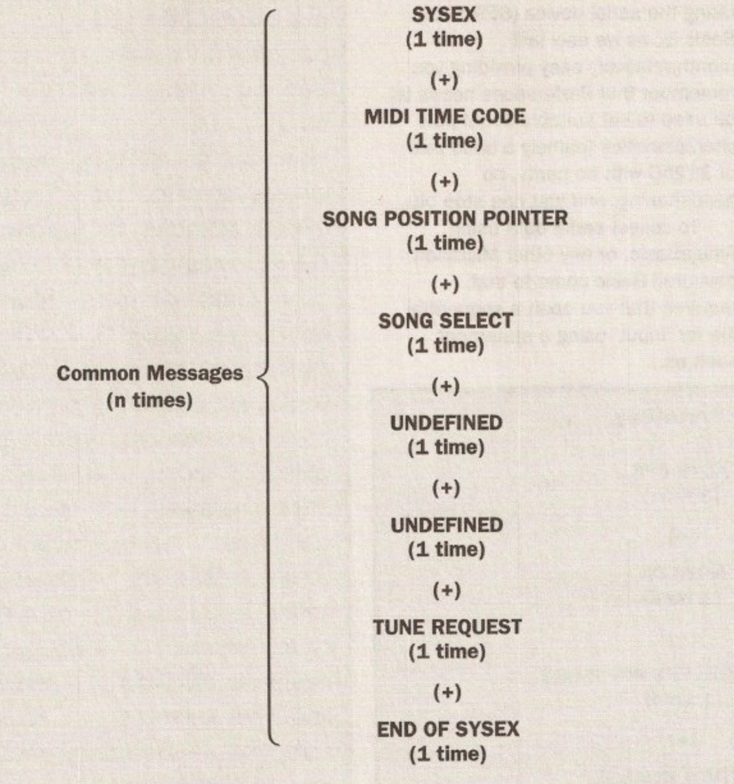
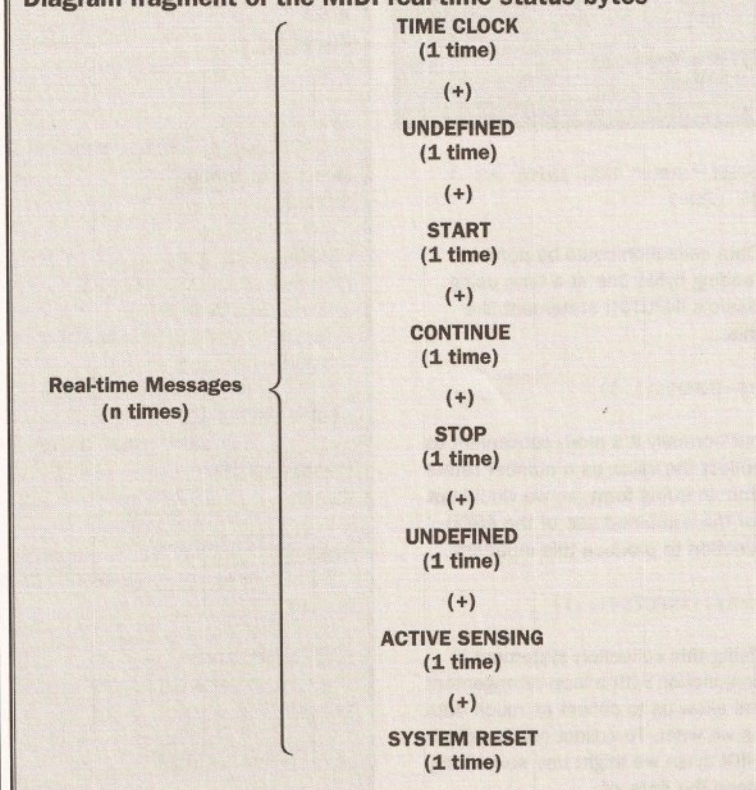


Figure 4:
Diagram fragment of the MIDI real-time status bytes



SOME EXTRA GOODIES...

If you are happy with the logic behind the program given in listing 1 it'll come as no surprise to you to find that we can easily adapt it to cater for the remaining status bytes, ie the system common and real-time status identifiers. The system message status bytes, which are ignored in listing 1, can be checked and on the basis of bit 3 we can execute one of two subroutines like this...

```
SYSTEM.MESSAGE:

IF (x AND &H8) THEN GOSUB ↵
REAL.TIME.MESSAGE ELSE ↵
GOSUB COMMON.MESSAGE
```

By defining additional string arrays to hold the names of the various system and real-time messages, and relating the text entries to the appropriate bit patterns of the status bytes, it becomes easy to display the names of the status bytes as they are detected.

Listing 2 gives the final version of the program. Once you learn to understand how the nested subroutine status byte analysis scheme is used in conjunction with the bit patterns of the status bytes you'll be able to use similar ideas in any number of MIDI utility programs.

It's also worth pointing out that these ideas of allowing the subroutine nesting to mimic the nesting inherent in the data can be equally easily applied to programs written in C, assembler or any other language.

LAST WORDS

You will see from the code examples developed this month that a strong relationship exists between the hierarchies implied by diagrams 1-4 and the structure of the Basic code.

This relationship between the hierarchies is no coincidence and, in fact, it stems from the fundamental relationships which exist between computer programs and their data. Unfortunately this isn't the place for proper discussions of such issues but I feel that it is worth pointing out that a number of useful program design techniques are available which make use of these types of relationships.

Anyway, that's enough of the 'techie' material. Next month I'll be moving away from programming issues and firmly back to the music side of things for a while! AS

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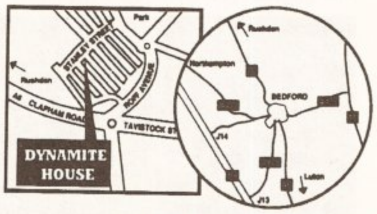
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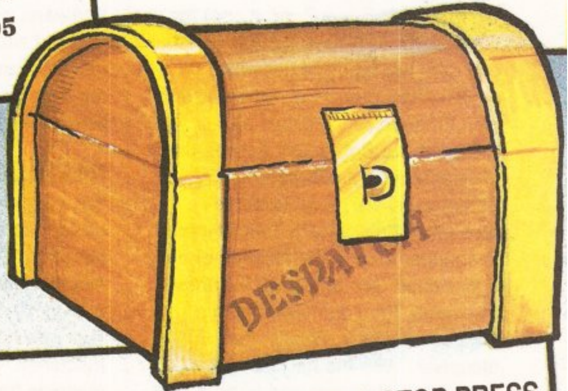
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LAN of the giants

Are your wires crossed about local area networks? Take the lead from Brian Watson and unravel the net worth of networks

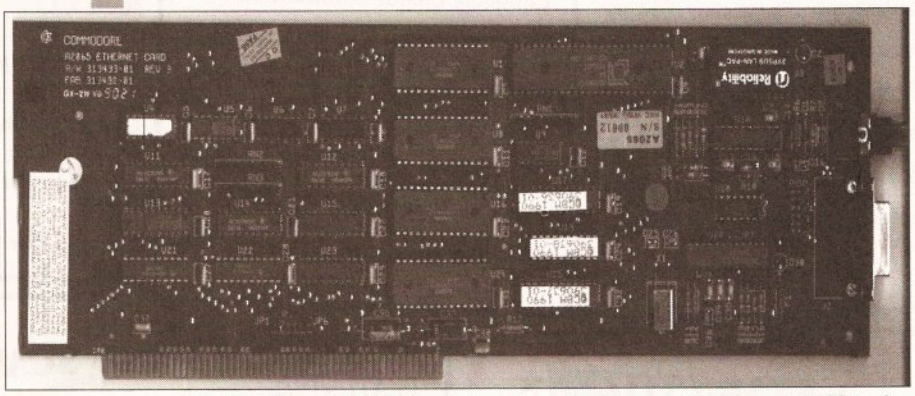
Local area networks (or LANs) are the answer to problems of data transfer in offices and schools. Here we'll be taking a look at a real life situation: the installation of an Amiga network at DMA Design in Dundee made possible by Oxxi's ACS software.

THE REQUIREMENTS

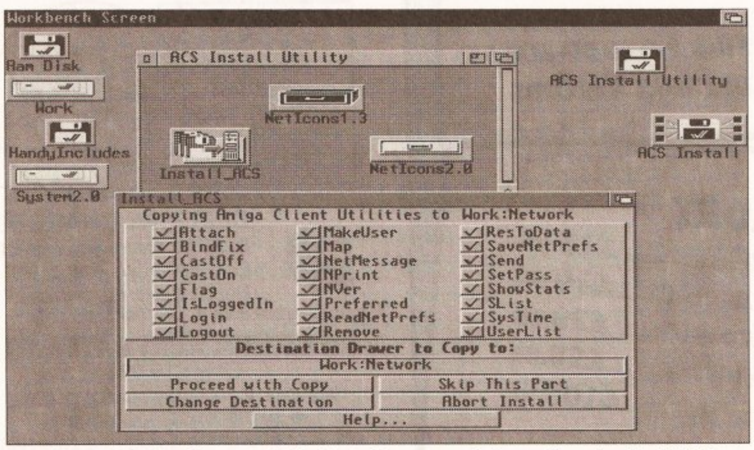
Obviously the first task was to set about purchasing the required hardware and software. As we were constantly having to transfer computer data from Amigas to PCs, this was the prime consideration when setting up our new system.

The A2065 is a Zorro II card for the A3000, A1500 or B2000 which can take two types of network cabling, Standard Thick Ethernet and Thin Ethernet (also known as Cheapernet). Both cabling types have the same data bandwidth but Thick Ethernet is less prone to noise problems. Cabling with Thin Ethernet is cheaper (hence the nickname) and a lot easier, you only have to thread through a 7mm diameter cable instead of 15mm. Finally, the fileserver. With the network we chose, the fileserver had to be a 486 based PC. We installed three hard disks which gave an on-line storage capacity of 500Mb.

The only software which has been available to work with the A2065 card is Network Filing System (NFS) client software by Commodore. This enables the Amiga to connect to a Transport Control Protocol/ Internet Protocol (TCP/IP) based NFS server (typically a Unix workstation). This seemed to be the only option, but I then heard some interesting information about some new software for the Amiga which would enable it to connect to a Novell Netware based network (which is PC based). This software, called ACS – Amiga Client Software, was still in Beta test but Oxxi did allow us to become part of the Beta test program. With this in mind we decided to go for a Novell Netware based network.



The A2065 card. This plugs into a Zorro-II slot on an A3000 or A1500 and connects to an Ethernet based Network. This card converts parallel data from the Amiga to the serial data form required by the network



Installing ACS. The format of this install program follows the standards laid out by Commodore comply with a Workbench 2.0 feel

INSTALLING ACS

Installing the ACS software is very straight forward. First you have to install a "Key" from the Amiga to the fileserver; this is to allow a security access by Amigas to the fileserver. This only has to be done once for all machines. To install ACS on each machine just insert disk 1 (of 5) and run the install program from the Workbench and follow the instructions. No hardware specific information is needed (except for the type of network card).

To make the installation of this software much quicker I created a script on a floppy which would first log-in (from floppy) to the network and then copy all files required from the network to the local machine. It would have been nice if Oxxi included this in their installation process.

LOGGING IN

Logging in can be achieved by using the command line version of the login command and typing 'login'. This prompts you for your username and password; you can provide the username as a command parameter; if so you are no longer asked. If you do not have a password set, the password prompt does not appear. You can also use the Workbench version of the login command. Here you fill out the relevant sections on the display and it logs you in.

The Novell Netware system wide log-in script can have sections which are specific to the Amiga. This is useful for setting up such things as

CONTACTS & COST

The cost of setting up our network for 13 Amigas and 6 PCs was:

Item	Cost/Each	Sub-total
The Fileserver		£3000.00
Novell Netware V3.11 20 user		£1495.00
Amiga Client Software 20 user		£ 760.00
A2065 network cards	£ 249.00 * 13	£3237.00
PC Network cards	£ 129.95 * 6	£ 779.70
Cabling & connectors		£ 450.00
	Total Cost	£9760.70

UK price rates are not fully available. To give a guide, the US prices are:

Number of clients	List price	Cost/client
1	$199.00	$199.00
5	$499.00	$99.80
10	$899.00	$89.90
20	$1299.00	$51.96
50	$1799.00	$35.98
100	$2999.00	$29.99
250	$5999.00	$24.00

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directory assigns for software stored on the network. We also use it to set up assigns to a personal directory.

SECURITY

The ACS software and Netware provide for security by the use of passwords. On top of this, people can be restricted or granted access to specific storage areas on the fileserver. Here, each person has his own directory areas to which no one except him has access. To help exchange between project groups we have directories set up for each group: the members of that group can have access. Netware allows you several levels of access...

- **User level** – Security can be assigned to individual users (ie access to their own directories).
- **Group level** – Users can be a part of a group (such as ARTISTS, PROGRAMMERS, EVERYONE etc) and as a member of that group they can be granted access to directory areas that they are involved with.
- **Supervisor level** – Supervisor has overall access to the network filesystem. There are no restrictions. As you could guess, DELETE NDO: ALL could be quite dangerous, so the supervisor account has a password only known by a few people.

Files can be marked with attributes which enable it to be read/only read/write, sharable, archived, deletable, searchable, executable and so on. This is independent of the facilities allowed by AmigaDOS, thus, only people with sufficient privilege can alter the file status. For executables, they are normally set to Read Only/Sharable – this helps to prevent viruses on the network software.

FILENAMES

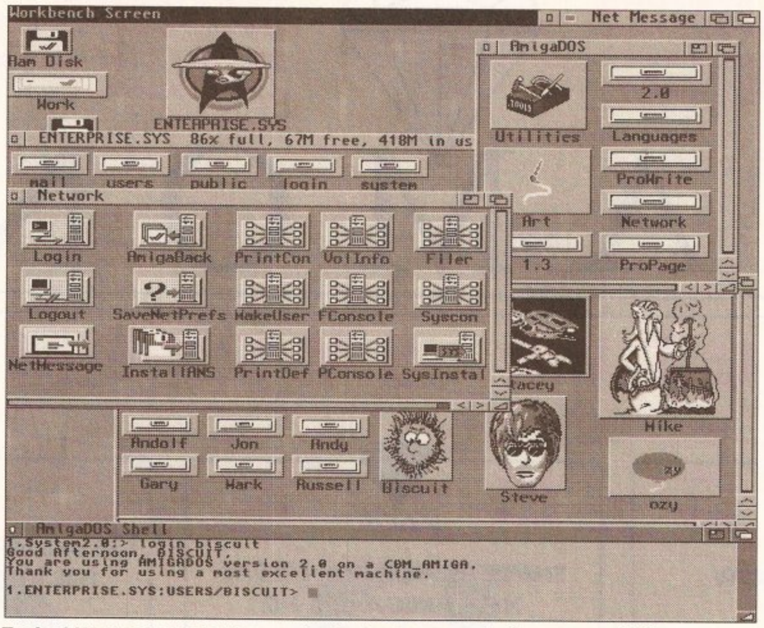
As you may be aware, IBM PCs have an annoying restriction on filenames. They are restricted to eight characters followed by a "." and another three characters. The Amiga has no such restrictions (the maximum being in the region of 38 characters). Since Netware was designed for PCs it also has this restriction. Netware can also be used with Macintoshes which have no such restrictions in name length, so the design team at Novell introduced a "Macintosh name space" which allows names up to 256 characters for each file. This has to be added to the volumes to be accessed by Amigas to allow full length names.

USING THE NETWORK

ACS provides a new device called NDO:. The device is given a volume name constructed from the fileserver name as well as the volume on that fileserver.

Our fileserver is called ENTERPRISE (spot the *Star Trek* fans!), the main volume is called SYS and so NDO: is assigned the name ENTERPRISE.SYS: The reason for including the fileserver name is that one machine can, potentially, be connected to many fileservers.

The icon for NDO: is present on the Workbench (ours has been redefined to look like the Enterprise). Access is just the same as any other device on the Amiga – totally transparent.



Typical Workbench display – note the large amount of space available on ENTERPRISE SYS. Screen shows logging in with the command line version

BACKING UP

A network provides us with a method of centrally controlling backups; eg, a programmer could keep a copy on the network of all of his current source files, updating them at regular intervals. At a later stage (say once a day or once a week) this could be backed up on to a tape streamer. The advantage of doing this is speed; it takes only a matter of seconds work, meaning backups are done much more frequently.

JARGON BUSTING • JARGON BUSTING

Fileserver – A computer in a network that controls all of the network traffic. Generally used as a central storage area for files.

Autoconfig – This is a special hardware protocol designed by the engineers at Commodore to allow expansion cards to be added to the Amiga with as little hassle as possible.

Network Filing System (NFS) – Designed by Sun Microsystems NFS, enables exchange of filing system information over a network with the minimum of problems. Works in tandem with TCP/IP as base transmission.

Transport Control Protocol / Internet Protocol (TCP/IP) – One of the ways in which information is passed from machine to machine.

Amiga Client Software (ACS) – This product allows Amiga computers with A2065 Ethernet Cards to connect to a Novell Netware based network.

Novell Netware – This product is a PC based network operating system. It is designed to efficiently transfer information from a central file storage area to a client computer. It is one of the most popular network operating systems for the IBM PC.

Ethernet (thick) – A standard cabling system to allow the connection of many computers on a network. This type of Ethernet cabling uses cable which is 15mm thick. It requires special devices (known as tranceivers) to connect from the computer to the cable – over and above any network card used. Its maximum cable length is much greater than Cheapernet.

Cheapernet (thin) – This is similar in concept to Thick ethernet since it allows computers to be connected in a network – although Cheapernet is based on 7mm cable. This cable is considerably cheaper and easier to install although maximum cable length is less than half of Ethernet (roughly 180 metres)

Client – Computer connected to a network requesting use of a fileserver.

NETWORK PRINTING

With ACS, Oxxi has provided for using a network printer.

To allow you access to the network printer queues you have to define which printers are to be attached to each queue. This can all be done from a set of programs called PRINTDEF/PRINTCON. PRINTDEF creates the definitions of a particular type of printer (eg, Epson LQ880, HP LaserJet III) and also the forms used with that printer (ie the paper sizes). PRINTCON allows you to set up your own printer job definitions such as the type of paper for a particular printer and which printer is to be your default. This has to be done for each user but it can be done by the system supervisor and then copied from one person to another.

DATA TRANSFER RATES

No network software review would be complete without data transfer rates. The Ethernet standard allows for a 10 megabit per second transfer rate. In theory, this gives a maximum burst rate of roughly 1Mb per second. In practice this is far from the case. Limitations are due to the Speed of Ethernet cards and also the speed of the controlling software. I wrote a small program that would test the transfer rate of the network by writing a 2Mb file and then reading it back. The results follow:

Test type	*Write rate*	*Read rate*
ACS	249K/sec	195K/sec
Amiga NFS	240K/sec	235K/sec
Amiga Hard Disk	609K/sec	584K/sec

As we can see the transfer rate to local hard disks is roughly two and a half times greater. These tests were performed on an A3000.

CONCLUSION

To say that our network has become one of the most important purchases we have made would be an understatement.

If our network fails, not much gets done (this, thankfully, does not happen very often). Attaching Amigas to the network could not have been done so easily without ACS and it, in my opinion, gets the full seal of approval. Score: 4.9/5, never commit yourself to a 5! The performance, although slower than a hard disk, is very acceptable and any delays due to network traffic are negligible.

The advantages of having a central file storage area with a single tape backup unit are too many to list. If you use a large number of Amigas in your work place it is well worth consideration. AS

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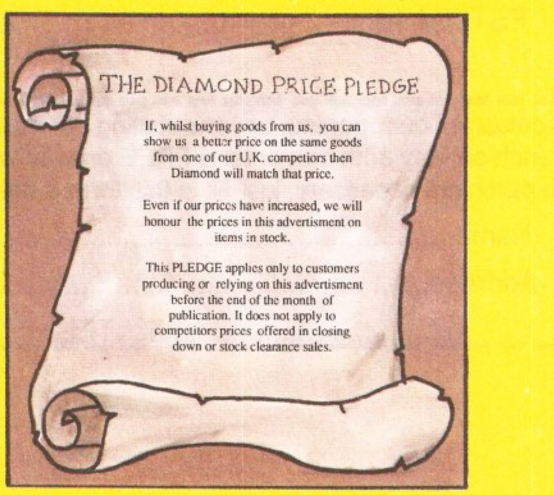
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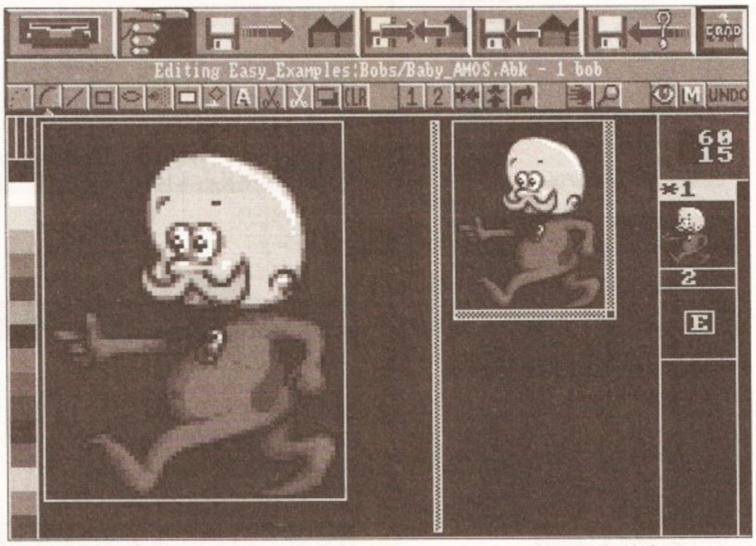
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AMOS ACTION

Jason Holborn gives us a sneak preview of Easy AMOS, updates to AMOS and continues his look at the ancient art of games programming



The _Easy AMOS_ Sprite Editor is an absolute joy to use. It may lack in some areas, but it still manages to beat the standard editor hands down

It's been a busy month in the world of AMOS. By the time you read this your local software store should have started to stock _Easy AMOS_, the latest addition to the AMOS range. I'm not going to say too much about it at this point in time because I know that our illustrious Editor is planning to run a comprehensive review very soon, so I wouldn't want to spoil the main course by filling you up with facts and figures at this early stage.

Thanks to Richard Vanner and Paul Shrimpling at Europress Software; I was lucky enough to get my hands on the master disks for *Easy AMOS* before they were sent for duplication and from what I've seen I have to say that I'm very impressed. Although Europress is very keen to point out that *Easy AMOS* is more of an introduction to AMOS for would-be programmers than an alternative to its big brother, it still manages to provide most of the facilities which have made AMOS such a giant killer. Indeed, some aspects of *Easy AMOS* are actually better than AMOS! Don't let this worry you though – Europress assures me that these improvements will eventually make their way across to the 'real' AMOS when *AMOS 2* surfaces.

I was particularly impressed with the *Easy AMOS* Sprite Editor, which is certainly a vast improvement on both the standard AMOS Editor and even Aaron Fothergill's *SpriteX*, the enhanced editor bundled with the AMOS Compiler. It deliberately lacks in a few areas, but ease of use has been maximised to make it a far friendlier and more solid program to work with. I've always used *DPaint* to draw all my sprites, but I've since swapped over to the *Easy AMOS* Sprite Editor in preference to both *DPaint* and *SpriteX*.

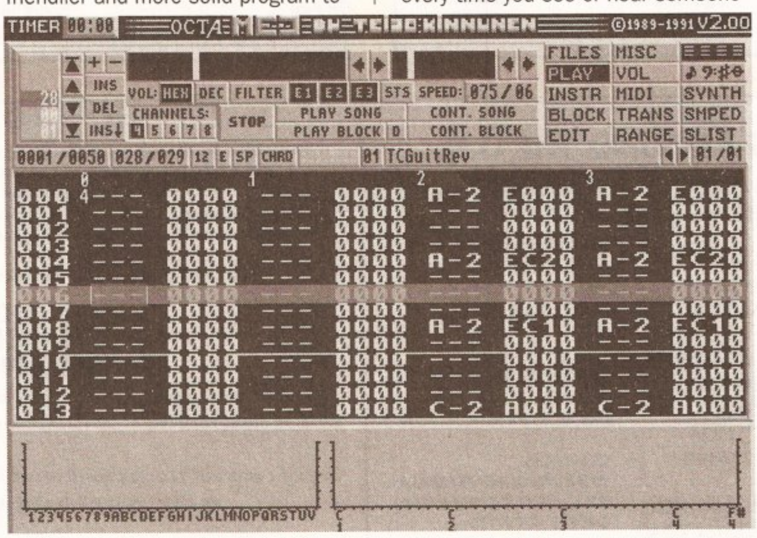
WHAT'S IN A NAME?

On the subject of *AMOS 2*, Europress informs me that the name has been changed so this is the last time you'll ever hear me refer to the new release as *AMOS 2*. From now on, every time you see or hear someone talking about *AMOS 2*, slap them on the wrists and ask them politely to call it *AMOS Professional* instead.

I'm not quite sure why the name has been changed, but you've got to admit that the new name certainly sounds a little more inspiring than plain old *AMOS 2*.

I'm sure Europress would like me to quickly point out that *AMOS Professional* is still a long way off, so don't jump on the phone and start badgering them quite yet.

Europress is however interested in hearing from you concerning what you'd like to see in the new release. Once again, don't phone – they're a busy lot! If you can, boot up your word processor and write them a letter instead. That way, the company can hang on to your suggestions and perhaps even hand them straight on to Francois Lionet, the AMOS programmer.



With the release of _AMOS 1.34_, you can load and play Sound Tracker modules directly without having to convert them to AMOS format first

NEW AMOS RELEASED

Staying on the subject of new releases, AMOS users will be pleased to learn that despite the frantic activity surrounding the release of *Easy AMOS*, Europress hasn't forgotten the rest of us. It has just released upgrades to both AMOS and the AMOS Compiler, bringing both up to version 1.34. As well as a few bug fixes, Europress has even found time to add a few extra commands. Here's what the AMOS upgrade has to offer.

● Sound Tracker support

Sound Tracker programs are advancing at such a phenomenal rate these days that Europress has decided to build direct support for Sound Tracker modules into AMOS itself.

The Module player built into AMOS is based around the player routine supplied with one of the most popular PD Sound Trackers, *Star Trekker*. The Star Trekker routine supports all the usual Sound Tracker functions plus synthetic instruments and a host of other fancy features.

Sound Tracker module support consists of four new commands –

TRACK LOAD <Filename> (loads a Sound Tracker module into a memory bank), TRACK PLAY n,p (plays the module stored in bank n starting at pattern p), TRACK LOOP ON/OFF (turns off automatic looping when end of module is reached) and TRACK STOP (stops the module currently playing).

Although the new Sound Tracker command provides a much simpler way of playing modules, Europress is keen to point out that it is not as powerful as the normal AMOS music system. For starters, playing a Sound Tracker module ties up all four of the Amiga's sound channels. You cannot therefore play samples and a module simultaneously. If you do, this could well result in your machine crashing. If you need to play both simultaneously, then the only way to get around this is to convert the module to AMOS format first.

Another limitation of using Sound Tracker modules with AMOS is that the VOLUME command will not work; subtle fades are therefore definitely out of the question. Surprisingly though, the good old =VU METER function does work. Strange but true!

● Extended sound support

Once again AMOS programmer Francois Lionet has listened to your complaints! AMOS 1.34 includes quite a few enhancements to AMOS' sample playing routines including the inclusion of a couple of new commands and functions.

Probably the best of these improvements is support for larger samples. AMOS used to be restricted in this area, but you can now play samples that are actually larger than the memory inside your Amiga using AMOS' new double buffer sample commands that pull in new sections of a sample whilst it is playing using a sort of FIFO (First In, First Out) arrangement.

The new commands are:

- SLOAD – loads a sample file of a specified size opened using the normal file handling routines into an allocated memory pool.
- SAM SWAP – swaps channels under interrupt.
- =SAM SWAP – returns -1 or 0 depending upon whether the sample swap was successful.
- SAM STOP – stops a sample that is currently playing; believe it or not, but previous releases of AMOS did not allow you to do this!

Sample double buffer is handled under interrupt so it's possible to get very long samples playing continuously from hard disk without a glitch in sight (sound?). This feature doesn't work too well with floppy drives though – due to the slow speed of floppies, the maximum playback rate that you can achieve without glitches appearing is around 4-5 KHz. Even then, the maximum sample size will be restricted to the 880K that an Amiga floppy can handle.

● Enhancements

Quite a few of AMOS' existing commands have been either rewritten for an extra spurt of speed or enhanced. Enhancements include a much more powerful =COL(Bob) function for collision between Bobs and a more powerful file requester (you no longer have to select 'SetDir' every time you change directories and physical devices are shown as well as disk device names).

Load IFF has also been brought bang up to date so that it accepts 8-bit colour palette definitions (some software packages now save palette information in this new format to cover possible enhancements to the Amiga's graphics hardware) and AutoBack 2 mode is now a lot smoother (it used to flicker terribly!).

As was the case with previous AMOS updates, versions 1.34 of both the Compiler and AMOS are available from the AMOS PD Library in the form of an installation program which tears your existing AMOS program to pieces and reconstructs it with the new commands and enhancements in place. (For more information contact Sandra Sharkey on ☎ 0942 495261).

• TOTALLY AMOS 3 •

The third issue of Len Tucker's Totally Amos disk magazine is now available. It's packed with the usual selection of hints, tips, tricks and news for AMOS programmers everywhere.

For more information, write to Len at 1 Penmynydd Road, Penian, Swansea SA5 7EH.

••• HOW TO SNAP UP A BARGAIN •••

If you're one of those poor unfortunates who still don't have a copy of AMOS to call their very own, then despair no more... If you turn to our mail order pages, you'll find an *Amiga Shopper* special offer – this means that you can grab yourself a copy of AMOS for only £35.95! That's a saving of £14. Oh and while we're on the subject of great bargains, there are plenty other *Amiga Shopper* offers to check out. Look out for AMOS Compiler, Devpac 3 and Hisoft Pascal; the list goes on...

AMOS ANSWERS

If you've got a problem with AMOS, send it to: AMOS ANSWERS, Amiga Shopper, Future Publishing Ltd, 30 Monmouth Street, Bath, Avon.

BANKS FOR THE MEMORY

I am trying to write a demo using AMOS but I'm having problems sussing out banks. Having looked through a few demo programs, I notice that such things as background images, bobs and music are packed into AMOS banks and saved out with the program, but I can't work out how to do this within my own programs. How do you do it?

MJ Turner, Leeds

When you save an AMOS program out to disk, the interpreter doesn't just save the source code to your program. Stored along with it are all the banks to which the program refers. This explains why AMOS source code files can be rather large at times.

You haven't already worked this out for yourself because you are probably loading all the background images, bobs and music from within the program itself. This means that although your demo already has all the banks that it needs, your program will just reload them every time it is run. To get around this, remove the lines from your program which load information into banks and enter these from direct mode when you start to code your demo. Once they're loaded, they'll be saved off with your source code, so there's no reason to reload them unless you make any changes to them.

STUCK ON AMAL

I'm stuck on one particular aspect of AMAL. I've written a section of AMAL code which handles a bunch of variables that I need to access from within AMOS BASIC. How do I pass variables between AMAL and AMOS and back again?

H Farnham, Westover

AMAL registers (variables) basically come in two flavours – external (RA to RZ) and internal (R0 to R9). External registers can be read simply by reading the value returned by the =AMREG(register) function. (Register must be a value between 0 and 9 denoting the register number).

Internal registers can hold different values between different AMAL programs (even if they are running concurrently), so the =AMREG() function has to be passed an extra channel parameter which tells it which AMAL channel to read the value of the register from. The format is =AMREG(channel,register) – once again, register must be a value between 0 and 25 (0 being RA and 25 being RZ).

Writing a value to an AMAL register uses exactly the same function, but instead of reading from AMREG(), you must write to it by placing the equals symbol after the function name. Say you wanted to pass the value 25 to RA. All you would have to do is to enter the following line AMREG(0)=25.

MUSIC MAESTRO PLEASE!

I've written a tune for my AMOS program using *OctaMED*, but AMOS doesn't seem to have a converter program which can convert *OctaMED* modules to AMOS format. Please help!

D Chapman, Dundee

You're right, AMOS doesn't support *OctaMED*-format tunes, but there is a way of getting around this limitation. With *OctaMED* running, reload your tune and then select 'Save MODULE'. Instead of choosing 'Song+Samples' as the module format, click on 'ST MODULE' instead. This will save out the *OctaMED* tune in standard SoundTracker format which can be converted to AMOS format.

PRINTS CHARMING

I've just bought AMOS and I'm trying to get it to print out a listing to my Panasonic KXP-1081 printer. The AMOS manual says that I can get a listing by typing 'LLIST' when in direct mode, but this doesn't work. Is it a problem with my printer or the wrong printer driver?

K Hughes, London

You're right that the AMOS command to print out a listing is LLIST, but there's one small problem – LLIST doesn't actually exist in the AMOS command set. Although the manual documents the command, it never made it into the AMOS interpreter so there is no direct way of printing out a listing. Considering the amount of updates that have been released, I'm surprised Europress still hasn't fixed this.

The good news though is that there is a way of getting around this limitation. Enter the 'Block' menu and mark out your entire program as a block using the 'Set Start of Block' and 'Set End of Block' functions and then click on the 'Print Block' function. You will then get a print out of your program listing.

GAMES PROGRAMMING MADE EASY



With a background image and a bankful of bobs, this is what the two routines – hardware scroll and main ship control – will produce

You will no doubt, by now, be just raring to make a start on the *Amiga Shopper* arcade game (which will be produced entirely in AMOS, of course!). Last month we took a good long look at just how games tick, but this month we're going to start to turn all that theory into practice.

Before you start to write any of the game though, it's worth taking time out to consider exactly which type of game you want to write and which routines you'll need to make it all tick.

Our *Amiga Shopper* game is going to be a cross between the classic Williams' arcade game *Defender* and a not so classic arcade game called *Scramble* (anyone remember that one?).

SETTING THE SCENE

The basic idea behind the game is to have a little space ship flying along the surface of a barren moon, blasting meanies as they appear from the right hand side of the screen. They may even fight back (I haven't decided yet!), so it won't be entirely a one-sided fight.

Right. We now know what type of game we want to write, but you should never start work on any programming project when you're just sitting in front of your Amiga.

PLANNING AHEAD

Before you go any further, you must break the game down into 'meat' and 'bones'. The 'meat' consists almost entirely of the routines defined within our main game loop – handling attack patterns etc, while the 'bones' of our game are low-level routines which handle house-keeping chores such as scrolling the screen, moving bobs etc. These routines are very important because they act as the foundations for the 'meat' routines. In the case of our game, we basically need 4 'bone' routines and they are as follows...

• Hardware scroll

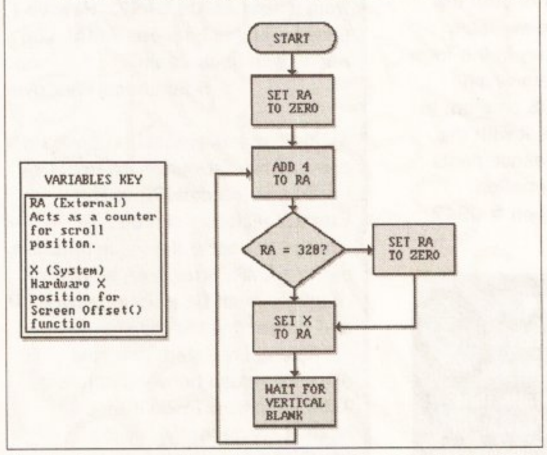
Unlike a true *Defender* game, we only need the background to scroll into a single direction (right to left) at a constant rate (2 pixels per vertical blank), so this routine can be handled more than adequately by AMAL as we can leave AMAL to get on with the job while our main game loop handles the more complex routines.

• Ship control

Yet another routine which AMAL will be able to handle. Because the background will be constantly moving, we need a routine which will update the position of the player's ship to counteract the screen scroll. Blitter objects (Bobs) are rendered as part of the bitmap, so this is necessary to keep the ship centralised.

This routine can also be extended to handle joystick input, moving the player's ship up, down, left and right in accordance with the position of the player's joystick. Once again, having this running under interrupt will save us a lot of processor time which the slower AMOS BASIC commands will need.

THE HARDWARE SCROLL ROUTINE



The hardware scroll routine is very simple indeed. All it does is maintain a counter between 0 and 320 which is then passed to the Screen Offset 'X' parameter

• Alien ship control

The routine which will handle Alien ship movements can also be written under AMAL; although it's going to be slightly more complex than the main ship control routine simply because a certain amount of intelligence will have to be built into the aliens.

• Missile control

No surprises for guessing what this routine does! Yep, it's yet another general purpose routine which will handle the update of missiles fired by both the player's ship and the aliens.

At the moment, these four routines are all that is needed to get our game up and running.

Once all four routines have been written, we should start to see something which resembles a game, but it's going to take time. To get you started though, we'll start with a look at the first two routines – the Hardware Scroll Routine and the Ship Control routine, both of which are written under AMAL.

HARDWARE SCROLL

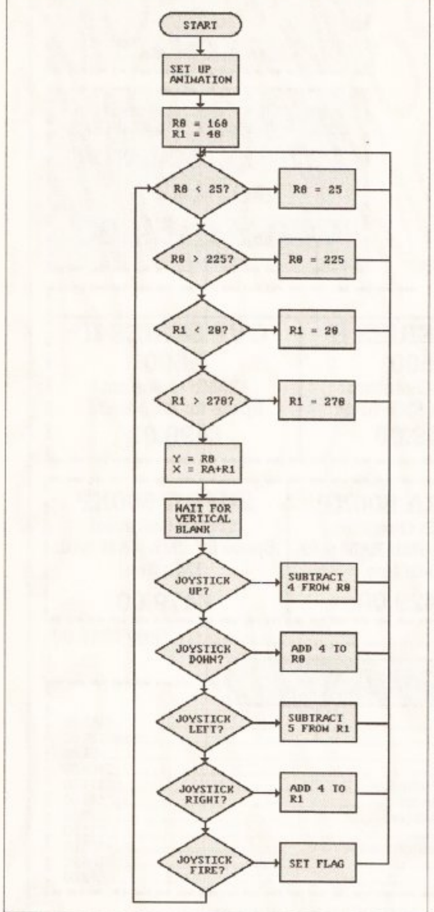
Before we can do anything, we need a background which can be scrolled. You could use something like the AMOS TOME map utility to create the background from discrete graphic blocks, but I'm going to be very lazy and use a straight IFF image instead. This method generally uses up a lot more memory than using maps (our background image is actually a 640 by 256 pixel 32 colour bitmap, scrolled past a 320 by 256 pixel viewport), but games like *Defender* don't really require a complex background anyway, so it's OK to cheat. Not only that, but screen refresh will be much faster if we don't have to mess around with the AMOS ICON commands.

> **"The basic idea is to have a space ship flying along the surface of a barren moon."**

So you've booted up *DPaint*, what now? Well, before you dive straight in and start drawing a 32-colour background that wouldn't look out of place on a HAM screen, you must remember that the colours which you use within your background image will also be used by your Bobs, so start by allocating some colours to the background and others to your bobs.

For our game, I used a 16-colour screen, allocating four colours to the background image (our game is based on a baron moon, so we don't really need that many colours!) and

MAIN SHIP CONTROL ROUTINE



The main ship control routine handles joystick input and the ship's position on the scrolling background

12 to my bobs. Colour 0 (the background colour) will always be black (HEX $000), so this actually cuts the number of free colours available for bobs down to 11. Take away another colour for our Bob masks and that leaves us with 10 – It doesn't sound like a lot, I know, but that's plenty enough for our purposes!

Now you've allocated your colour palette, you can start to draw your background image. Any standard IFF paint package will do the job and once you're happy with your masterpiece, save it off to disk and then boot up AMOS. Now for the fun bit – coding the hardware scroll routine. As you can see from the source code below, the routine is actually fairly simple. All it does is perform a continuous loop that counts up from 0 to 320 in 4 pixel increments. Once the counter reaches 320, it is reset to 0 and the loop starts again. This value is then passed to the AMAL system register X which causes the screen to scroll. Each time X is updated, we wait one vertical blank before continuing the loop (using the AMAL command 'Pause').

MAIN SHIP CONTROL

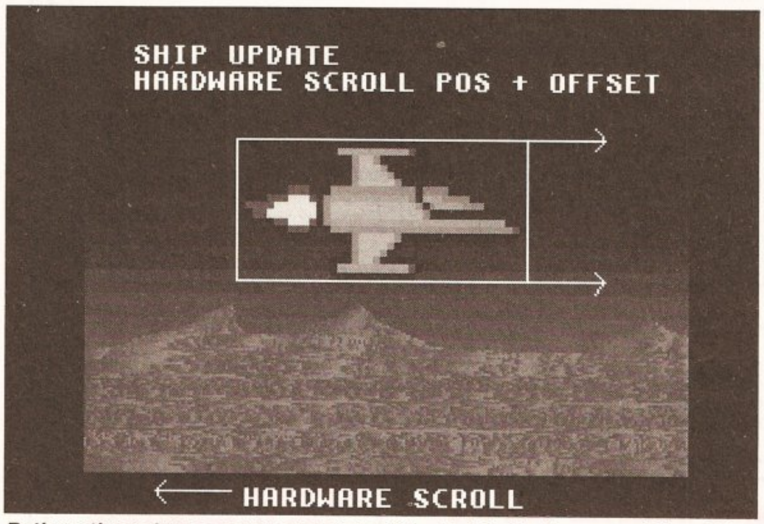
The main ship control routine is a lot more complex than the hardware scroll routine, but it uses the variable external register RA (which is set up in the hardware scroll routine) to keep everything in sync. At its simplest, all this routine does is read the value of RA and then offset it by the value defined within R1 (the X position of the ship), to keep the ship from scrolling off the screen.

The position of the ship can also be changed using the joystick. Within the main loop of this routine, the value returned by the AMAL J1 register (the joystick 1 register) is checked and the loop jumps to the appropriate routine to update the X and Y position of the ship accordingly. If the ship is moved to the right, then the X position of the ship is increased by 4 pixels but it is decreased by 5 pixels if the ship is moved to the left. If we were to decrease it by 4 pixels, the ship would move to the left hand side of the screen at exactly the same rate as the scroll, making it look as if the ship had just stopped. By decreasing it by 5 pixels, the ship will move to the left faster than the scroll.

The size of both the X and Y positions of the ship are checked within the main loop to make sure that they do not increase or decrease below or above 20 and 270 pixels (for the X position) and 25 and 225 pixels (for the Y position) respectively. If they do, then they are set to these minimum or maximum values before the new X and Y positions are passed to the X and Y registers. Again, after the bob position has been updated once, the loop is halted until the next vertical blanking period.

The joystick firebutton is also read and if the button has been pressed, then a flag is set and stored in the AMAL external register RZ. I'm not quite sure whether I'm going to use this at the moment, but it's there if we need it. After all, it always pays to be flexible!

Well, that's all there's time and space for this month; so practise what you've learned to be in tip-top shape for next month. AS



Both routines share a common register RA which holds the current X position of the hardware scroll. For the position of the space ship, an extra offset value is added to this register

●●● NEXT MONTH ●●●

Next month will be even more exciting than this because we'll be extending our game to include both the aliens and missile control routines. We'll also be taking a look at the AMOS 3D Object Editor and showing how you too can create the kind of fantastic looking 3D objects that would turn the pros green with envy. Stay tuned!

●●● LISTING ●●●

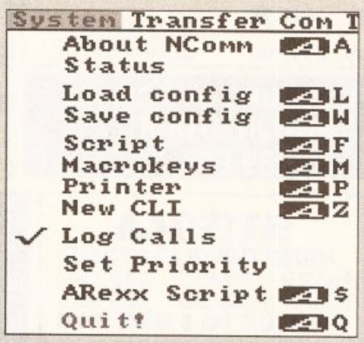
```
Rem ** SHOOTUMUP v0.1b **
Rem ** Written for Amiga Shopper **
Rem ** **
Rem ** by Jason Holborn **
Rem *** AMAL Control Program for Screen Scroll ****
S$=" Let RA = 0 "
S$=S$+" Begin: Let RA = RA + 4 "
S$=S$+" If RA = 320 Jump C "
S$=S$+" Jump D "
S$=S$+" C: Let RA = 0 "
S$=S$+" D: Let X = RA "
S$=S$+" Pause "
S$=S$+" Jump Begin "
Rem **** AMAL Control Program for Main Ship ****
A$=" Anim 0,(1,5)(2,5) "
A$=A$+" Let R0 = 160 "
A$=A$+" Let R1 = 40 "
A$=A$+" Begin: If R0 < 25 Jump E "
A$=A$+" If R0 > 225 Jump G "
A$=A$+" If R1 < 20 Jump H "
A$=A$+" If R1 > 270 Jump I "
A$=A$+" Let Y = R0 "
A$=A$+" Let X = RA + R1 "
A$=A$+" Pause "
A$=A$+" If J1&1 Jump Up "
A$=A$+" If J1&2 Jump Down "
A$=A$+" If J1&4 Jump Left "
A$=A$+" If J1&8 Jump Right "
A$=A$+" If J1&16 Jump Fire "
A$=A$+" Jump Begin "
A$=A$+" Up: Let R0=R0-4 ; Jump Begin "
A$=A$+" Down: Let R0=R0+4 ; Jump Begin "
A$=A$+" Left: Let R1=R1-5 ; Jump Begin "
A$=A$+" Right: Let R1=R1+4 ; Jump Begin "
A$=A$+" Fire: Let RZ = 1 ; Jump Begin "
A$=A$+" E: Let R0 = 25 ; Jump Begin "
A$=A$+" G: Let R0 = 225 ; Jump Begin "
A$=A$+" H: Let R1 = 20 ; Jump Begin "
```

NORWEGIAN MAGIC

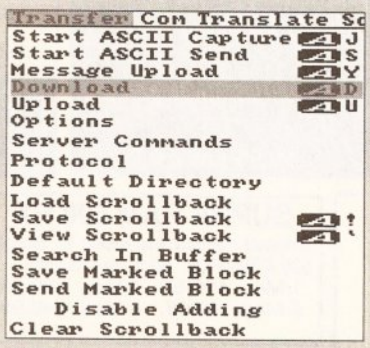
This month our comms expert Phil Harris investigates the latest incarnation of NComm, reviews the NComm Log Analyser and begins the ultimate guide to scripts

The latest version of *NComm* has just been released. Version 2.0 contains some useful enhancements, not least an ARexx port and improved script capabilities. It's also become shareware, for just $35 you can have your own copy, but is it worth it? As promised I'll be beginning a two part tutorial on the use of *NComm* scripts. Telling you how to make the most of the facilities available in what amounts to a very powerful programming language. I'll also be trying out the new *NComm Log Analyser* – it could help you keep track of your telephone bill.

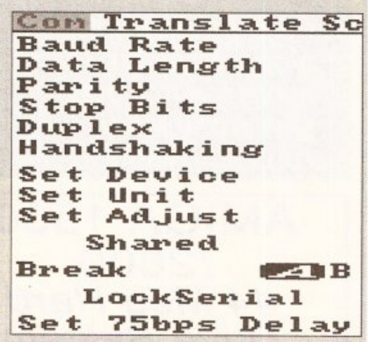
But first, *NComm*...



NComm's system menu contains all the general purpose commands



The transfer menu is home to all the transfer related settings



Use the com menu to control the rate of transfer

NCOMM 2.0

NComm from Norway has been one of the most popular comms packages on the Amiga since its release. Now it's been updated and has even more to offer.

NComm's system menu provides all the general purpose configuration commands such as program status, priority (for when you're multi-tasking), script execution, printer setup and configuration load and save. It also provides the gateway to those useful ARexx scripts and of course the QUIT command.

The *new* CLI command is also very useful. It opens up a CLI window for you to type commands into and is ideal for those times when you need to quickly archive up software to upload to a board. The macro-key feature is another worthy of note. It allows you to define a text string which is output whenever one of the function keys is pressed. This is useful for speeding up commonly entered strings such as your name.

The second *NComm* menu covers transfer related settings of which there are an awful lot, and also the useful scrollback facility.

PROTOCOL CRAZY

A host of options are available to control the multitude of file transfer protocols available (including XModem, ZModem and the new JModem). I won't go into the options here but they include automatic upload and download for ZModem, whether downloaded files should be given icons and whether a file transfer progress bar should be shown during downloads.

ASCII transfers are covered by the CAPTURE, SEND and MESSAGE UPLOAD options allowing you to upload preprepared text for messages to save time on-line (something I recommend you try to do as often as possible), and also capture incoming text for later.

The other method of keeping information for later is the comprehensive "scrollback" facility *NComm* provides. This allows you to review previous text, search for text within it, mark blocks and save them or transfer them down the serial port. Scrollback buffers can also be saved to disk and reloaded at a later date. This facility can come in very useful and it's well worth the time spent getting to know its capabilities before you start using *NComm* in anger.

COM MENU

The com menu controls the comm port settings used by the program. All the standard options are there, baud rate, data length, number of stop bits, duplex etc. Plus a couple of useful items allowing you to set the device used to access the port and the delay time for 1200/75 split speed operation.

TRANSLATE MENU

This menu provides functions which enable the software to function better with BBS systems running on non-Amiga machines. The majority of boards, for instance, run on PC compatible machines so *NComm* includes an IBM character set option (amongst others) to allow IBM style

continued on page 117

THE COMPETITION

So how about the competition? Surely *NComm* isn't the only Amiga comms package? There must be others...

Yes there are, the only real contender at the moment is *JRComm* from John Radigan. *JRComm* has been around since 1989 and is a very complete program, offering a bewildering array of options.

NComm and *JRComm* are very similar, both offer pretty much the same options although the approach is a little different. Now *NComm* has become shareware there is very little difference between the two. *NComm*'s big advantage lies in its script language and the new ARexx port, things which *JRComm* has never had.

I feel *NComm* is the stronger program, very crisp and clean and little has been heard of *JRComm* since its first official release. Of course this could mean that there is a big improvement on the way, but the program is so complete anyway that it's highly unlikely.

I would suggest you try out both for a while and choose the one you feel most at home with. I'll be taking a detailed look at *JRComm* next month so you'll be able to use that as a guide if you don't want the expense of downloading them both.

continued from page 115

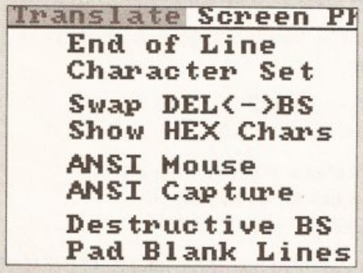
character graphics to be displayed.

Another menu option allows you to control how the end of a line is sent. Some machines use different combinations of LINEFEED/ CARRIAGE RETURN to the good old Amiga so *NComm* gives you the option to specify exactly which characters are to be sent/expected.

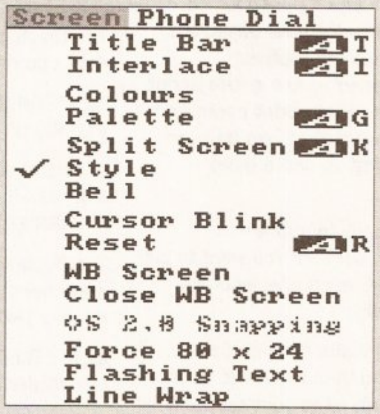
Also hiding in this menu is the modem setup menu item. This takes you into the modem setup screen where you can define initialisation strings etc to go with your modem.

DIAL MENU

The final menu in *NComm* is another useful feature. It contains the first 46 entries in the telephone directory. This allows you to rapidly select the board you wish to dial without going through the longer and slower method of selecting them from the phone book requester.



Above: a translate menu offers compatibility with non-Amigas



Right: the screen menu gives info on the display related functions

ANSI SUPPORT

NComm provides excellent support for ANSI control. The translate menu allows you to specify ANSI MOUSE support which allows you to use the mouse to move the cursor in the ANSI compatible full screen editors you'll find on many boards. ANSI capture specifies whether any ANSI control codes you receive should be saved in the capture files or not.

SCREEN MENU

The screen menu supplies display related functions including number of colours, what these are, flashing text, blinking cursor, whether a title bar should be shown and whether the screen should be opened in the masochistic interlace mode.

PHONE MENU

The phone menu provides (surprise, surprise!) dialling related entries including a path into the excellent phone book control requester. It is also possible to dial a number directly using the dial # command.

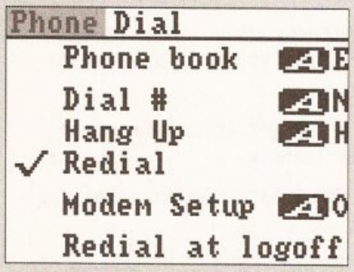
INTO THE FUTURE

NComm is such a complete program it is difficult to say what comes next, particularly now it contains an ARexx port. Of course the authors have plenty of ideas, including custom font support and an even better script language.

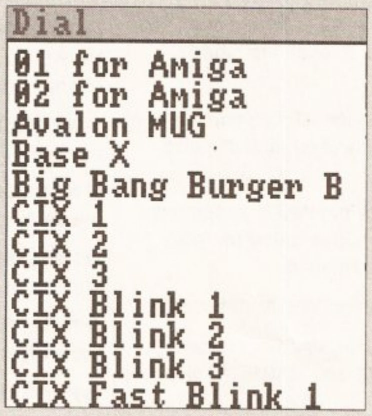
One function I'd like to see is built-in support for archiving and unarchiving files from within the software. Nothing too fancy, just the ability to call an archiver with the command to unarchive a file would suffice, although there's plenty of room for expansion and more complex support.

All in all, I think *NComm* is a truly superb comms package. The amount of thought that has gone into its design is obvious from the start, with some extremely useful

continued on page 120



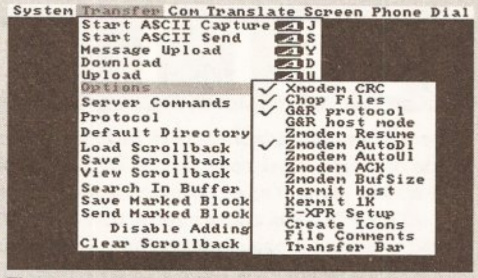
Above: the phone menu offers some corner cutting phone facilities



Right: the dial menu provides even more short cuts to dialling

WHAT'S NEW IN 2?

***NComm* 2.0 includes a great many improvements on version 1.921 and even more bug fixes. There's not room to list them all, but here are the highlights.**



The comprehensive transfer protocol options, all this for 215 NOK!

● **ARexx** –The biggest single improvement is the addition of an ARexx interface. ARexx is a programming language of sorts that concentrates on inter-program communication so ARexx could be used to call an external editor, tell it to perform some operations on a file and then return to *NComm*. A new field in the dialling directory allows you to specify an ARexx program to be run whenever you call a particular board or there is a menu option to call one direct.

● **Improved script** – The script facility has been improved and now runs approximately 20 times faster.

● **Redesigned fonts** –The two fonts used by *NComm* have been redesigned and improved by Bjorn Rybakken and also fixed a couple of bugs in the fonts (!) in version 1.8.

● **New 1200/75 baud support** – Version 2.0 adds support for the split speed 1200/75 which is popular on low cost modems. This will be a welcome addition as it also allows the program to be used to access Viewdata systems

● **Nodelist support** – *NComm 2.0* supports use of a "nodelist" via the traplist program. A nodelist is simply a list of bulletin boards with individual IDs for each one. Fidonet for instance, has a nodelist and each board is assigned a number such as 2:250/120. If you have a traplist file you can use a nodelist entry instead of the board's telephone number and it will look it up and dial it for you.

Unfortunately there is a catch, *NComm* does not come with the traplist program or the associated library so it's up to you to hunt it down. It won't be long before it appears in the UK though, and you'll hear about it through this column when it arrives.

The dialling code now maintains a record of the last time you called the BBS, not particularly useful but interesting nevertheless.

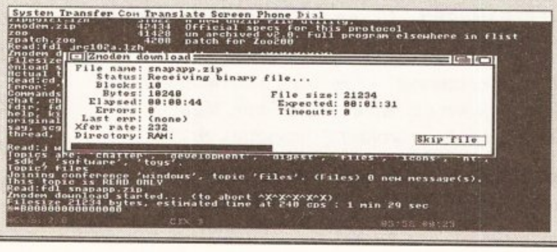
There are two new transfer protocols, Compuserve-QuickB and JModem. These are both supported using the xpr set of external transfer protocols but the authors of *NComm* haven't actually been able to test either of them! They won't be used much anyway so it's not too much of a problem if they don't work.

● **Graphic display on download** – A new feature has been added for downloads allowing a bar to be added to the download requester showing how much of the download is complete. Although it doesn't slow the system down much the authors have made this optional and this shows the amount of thought that goes into each new feature of *NComm*.

● **Filenotes** – Another new facility is the ability to automatically add an AmigaDOS filenote to a download giving the name or number of the board that it was downloaded from. This is certainly an interesting idea and can come in very useful.

● **Flashing text** – There is now an option to support ANSI flashing text although this will slow things down and can be turned off. If flashing is turned off but styles are turned on the flashing text will be shown in italics.

These are just some of the new features, features that make *NComm* the best comms package on the Amiga and justify its conversion to shareware.



Downloading a file with that brand new transfer bar

SCRIPTING FOR THE MASSES

PART 1 COMMANDS

NComm has one advantage over _JRComm_ – its powerful script facilities. Scripts can be used for all sorts of things. Most commonly to log on to a board automatically, including entering your password, but also to perform more complex tasks such as entering messages and downloading replies.

NComm 2.0 has added several new commands to the system and also speeded up the entire script facility, making it about twenty times quicker. In the first part of our tutorial on using script commands we'll give a summary of the commands available with some suggestions as to what they can be used for. Next month we'll complete the tutorial with some simple examples of logging on and a more complex script featuring a great many of these commands.

● **ASCSEND "filename"** – Sends the text file specified by "filename" down the serial port. This is ideal for entering messages written off-line.

● **AUTODOWN ONIOFF** – Turns the ZModem automatic download facility on or off. With this option turned on, as soon as the board you are dialling begins to send a file using ZModem, *NComm* will start to download it.

● **AUTOUP ONIOFF** – Turns the ZModem automatic upload facility on or off.

● **AUTOXFER ONIOFF** – This controls the G&R automatic upload/download options used by the MBBS system on or off. This is only useful if you call an MBBS system.

● **BEEP** – Causes the screen to flash or a beep to occur depending on the current alarm setting.

● **BREAK** – Sends a break to the modem you are calling. This may stop it doing whatever it is doing.

● **CAPTURE "filename"** – This captures all input and output and stores it in the file specified. This is a very useful option, if only because it allows you to keep a copy of what happened during the running of the script. This is helpful if the script fails for some reason, line noise for instance.

● **CAPTURE OFF** – Stops the current capture and closes the file.

● **CAPTURE ON** – Restarts the capture after a CAPTURE SUSPEND.

● **CAPTURE SUS** – Temporarily halts the capture until a CAPTURE ON command, useful if you want to skip some system messages to save space in the capture file.

● **CD "directory"** – Changes the current directory for commands called using the CLI option and for downloads/uploads. This command has been added because problems occur using the AmigaDOS CD command.

● **CHAIN "filename"** – Starts executing another script. This comes in handy if you have large or complex scripts.

● **CLEARVARS** – Clears any variables you may have defined.

● **CLI "command"** – Executes a command as though it were typed in at the Shell. Ideal for automatically unarchiving messages etc.

● **CLRSTACK** – Clears the return stack. This will cause any current GOSUBs to be forgotten.

● **CONFIG "filename"** – Loads in a different *NComm* configuration files, useful if you want to call several boards in one script, each one requiring different protocol options etc.

● **CONVERSE "in" "out"** – Waits for a particular message to be received and then replies to it. This is one of the most commonly used commands. It allows good control over the timing of the script and is ideal for replying to password prompts etc.

● **DELAY seconds** – Waits the specified number of seconds. There is also a DELAY UNTIL option which waits until the time specified.

● **DIAL "boardname"[,"next"]** – Dials the board(s) named.

● **DIAL# "number"[,"next"]** – Dials a particular number.

● **DLWHEN** – Deletes the last WHEN command.

● **DORX "filename"** – New to version 2.0, this executes an ARexx script.

● **DOWNLOAD "filename"[,P]** – Downloads a file with the given name. A protocol can be specified if you require Z for ZModem, X for XModem etc.

● **DTENTHS tenthseconds** – Waits for the specified number of tenths of a second, useful for short, accurate delays.

● **DUMP ["filename"]** – Dumps all the variables etc to the screen or a file. Mainly used for debugging complex scripts.

● **DWHEN "string"** – Delete the WHEN statement checking for the string given. See below for more information on the WHEN command.

● **DWHENS** – Delete all current WHEN statements.

● **ECHO ONIOFF** – Determines whether characters read using INPUT, ASCSEND and MSGSEND should be echoed to the screen.

● **END** – Stops execution of the script.

● **GOSUB subroutine** – Calls a named subroutine at the label given. The label is created by adding a colon to the end of a word. eg MySubroutine: creates a label "MySubroutine". Saves duplication of code where identical portions of the script are used frequently, makes script easier to understand.

● **GOTO label** – Jumps to a label defined as above.

● **HANGUP** – Hangs up the phone

● **IF <exp> THEN <command>** – Executes the command if the expression given is true. Comparisons are created using the == operator which is case independent.

eg "BORIS" == "BORIS" is TRUE
"GERALD" == "DINKY" is FALSE

The result can be inverted to get not-equal-to using the ! operator.

eg. !"BORIS" == "BORIS" is FALSE
!"GERALD" == "DINKY" is TRUE

IF EXISTS will check to see if a file exists.
IF RING will check for a RING signal.
IF CARRIER checks for a CARRIER.

The IF statement also has the useful SELECTFALSE statement which opens up a YES/NO requester and returns TRUE if the user replied NO

eg IF SELECTFALSE "Slow modem" THEN GOSUB FastModem

Be careful with this one, the fact that it returns TRUE if the user answered NO is a bit strange and it's easy to get caught out.

● **INPUT $variable "stopchar"** – Reads characters from the serial port into the variable given until the stopchar is received. The TIMEOUT command also affects the INPUT command, it defines how long the command will wait for the terminating character.

● **LOADKEYS "filename"** – Loads in a new set of macro key definitions.

● **LOADPHONE "filename"** – Loads in a new phonebook file.

● **MENUSELECT "menu" item sub** – This powerful option allows you to call any menu item from a script file by specifying the menu title and the sub item to execute.

eg MENUSELECT SYSTEM 0 ;Open About Window
MENUSELECT TRANSFER 6 2 ;Selects KERMIT Change Directory

● **MESSAGE "message"** – Displays the given message on the terminal.

● **MSGSEND "filename"** – Sends the message to the serial port.

● **PADLINES ONIOFF**– Turns off the padding of blank lines.

● **PALETTE** – Calls the palette requester to change the program colours.

● **PRINTER ONIOFF** – Turns the printer on or off.

● **QUIT** – Quits *NComm* completely. An example of the use of this would be using a script to automatically call a board at a particular time every day, download the messages and then exit *NComm* and add the messages to an archive.

● **READVAR $variable** – Reads a line from the defined VARFILE (see below) into the variable.

● **REDIAL ONIOFF** – Turns redial on or off.

● **REPEAT<->UNTIL <expression>** – Repeats a loop until the expression given is true. This

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enhancements beyond those normal for a comms package.

I'm glad to see it's gone down the shareware road, I just hope it gets the support which it deserves. In fact, I wouldn't be at all surprised if it gets taken on by one of the smaller software distributors in the near future.

NComm should be available from just about any BBS, I know Guru 10 has it, as does CIX. The program is shareware with a registration fee of 215 NOK ($35).

LOG ANALYSER

Log Analyser is a new *NComm* log file analyser from Martin Chantler. The aim of the program is to provide a simple, user friendly program for analysing the log file *NComm* creates, giving you an estimate on the cost of the next telephone bill.

AMOS ALL ROUND

The first thing you'll notice about *Log Analyser* is that it is written in AMOS and then compiled. This gives the program a familiar feel which is not necessarily a bad thing.

SIX OF THE BEST

After entering the path for the program's data files you are presented with the main menu providing six options...

● 1 Daily usage
This gives you a graph of modem usage per hour.

● 2 Weekly usage
This option shows you a graph of usage split into days.

● 3 Top ten boards
Presumably this option would give you a list of the top ten most popular boards, unfortunately this option is not yet available and just brings up a message telling you that this is indeed the case.

● 4 Information on log
This option gives a summary of the log, what dates it covers, the number of calls in the log and the total time spent on-line.

● 5 Edit phone prices
This facility enables you to edit the charges used for calculating the cost of your activities.

The charges are shown in table form for each of the call bands, Local, A, B and B1, at each of the three charge bands.

This is an excellent method of controlling charge setup, very user friendly and much better than the text file format used by *Callinfo* (see *AS* 11).

● 6 Calculate
This is the meat of *Log Analyser*, it allows you to calculate the cost of your calls. There are two methods available, verbose which gives you individual call information on a per call basis including length of call and its cost.

The program cycles through each call displaying the information for a short time making it rather difficult to take it in at once. An option to print to a file or a printer would therefore be useful. The quick method is much less interesting and simply prints the total cost.

When the program is calculating your bill it checks each dialling code and if it doesn't understand it, it will prompt you for the portion of the number which is the dialling code and the charge band to associate with that dialling code. These codes are then saved to a data file for later use. Again this is a much better method than that of *Callinfo* which uses a plain text file which is edited by the user.

It seems strange that option 3, which would give you a listing of the top ten boards, isn't implemented yet. Although not a particularly useful feature, it is an interesting one. It seems to have been added in order to compete with *Callinfo* which has the same capability. The other strange omission is an exit option.

I did have a lot of trouble using the program at first, it was crashing whenever I tried to calculate a bill. It turned out that the software really needs to be in the same directory as *NComm* and the phone.rate data. Once I'd moved the program it worked much better although it did occasionally lock up for no apparent reason when run.

The program does seem to be a little unstable and has its idiosyncrasies but this doesn't detract from its usefulness too much – you'll only need to use the program once or twice a month anyway.

When all's said and done Log Analyser is much better than *Callinfo* and I'm looking forward to the next version which will no doubt fix the bugs and add some new features.

The author, Martin Chantler, can be contacted on Runway A500 BBS (0293 884117) a board, which incidentally, is well worth a visit.

COMING SOON

Next month I'll be taking a close look at the current version of *JRComm* and comparing it with *NComm*. I'll also be completing the script tutorial with some examples. See you all next month. AS

Philip Harris can be contacted as piharris on CIX or PHILIP HARRIS on GURU 10 BBS (0738 52063)

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command uses the same operators as the IF...THEN statement.

```
eg      REPEAT
        SEND "Is anybody there?"
        INPUT $cmd
        UNTIL $cmd == "YES"
```

● REQUEST ON|OFF – Turns system and *NComm* requesters on and off. If a script is being run without a human around it could be extremely annoying for the system to stop with an AmigaDOS, DISK FULL requester. This command stops those requesters occurring.

● RESUME ON|OFF – Turns ZModem auto resume on and off. Resume is a very useful function unique to ZModem. If a download begins and the destination file already exists, the ZModem protocol will examine the length of the file and begin transmitting from that point. This comes in useful if a download has failed for instance and half the file is left. ZModem resume would allow you to try again, only downloading the second portion of the file, saving you time and money.

● RETURN – Returns from a subroutine.

● SEND "string" – Sends the given string to the serial port.

● SET $variable = "value" – Assigns the given value to the variable. The variable must start with a $ and the next character must be a letter. *NComm* comes with several variables built in:

- $date contains the current date and time (READ ONLY).
- $ncomm contains the current version number (READ ONLY).
- $baud contains the current baud rate (Read/Write).
- $length contains the current data length (Read/Write).
- $parity contains the current parity (Read/Write).
- $stopbits contains the current number of stopbits (Read/Write)
- $charset contains the current character set (Read/Write).
- $filereq opens up a filereq and returns the filename (READ ONLY).
- $stringreq opens up a textreq and returns the string (READ ONLY).

● SIMPLEREQ "string" – Displays the given string in a simple requester, ideal for quick help messages to the user.

● TIMEOUT seconds [command] – TIMEOUT is a simple command which is surprisingly powerful. The simple format defines the timeout for all *NComm* commands. If the command does not receive a response within the timeout given it will go on to the next command.

The second syntax takes the form of a timeout value and a command that is executed should the timeout ever occur. For instance:

```
TIMEOUT 10 QUIT
```

would cause the script to drop out of NComm should the timeout occur, not a particularly useful example but there are better uses as we'll see next month.

The timeout command defaults to no timeout (0) so it is always a good idea to set the timeout to something sensible just to make sure.

● UPLOAD "filename"[,P] – Upload a file, optionally using the protocol defined by P, ie. Z for ZModem.

● VARFILE "filename"|CLOSE – Opens/closes a varfile to read in variables.

```
eg      VARFILE "ncomm:host/users/"$user ;open input file for reading
        READVAR $passwd ;place first line of file in variable $passwd
        READVAR $laston ;place second line of file in variable $laston
        VARFILE CLOSE ;closes the input file

        MESSAGE "Hello "$user"! You were last on at "$laston"\n"
```

● WAIT "string" – Waits until the specified string is received from the serial port, timing out if a timeout has been specified.

● WHILE <expression> DO ... ENDWHILE – Executes the commands within the DO and ENDWHILE statements until the expression is FALSE.

● WHEN "string" command – Another powerful feature of the *NComm* script language. Whenever the specified string is received the program will execute the command given. The most obvious use for this is removing regular prompts such as MORE? by replying with a Y whenever they occur. This stops the script file hanging because of an unexpected prompt.

● WRITE "filename" "string" – Writes the given string to the file specified.

•••• NEXT MONTH – EXAMPLES ••••

COMMODORE ATARI CITIZEN STAR AMSTRAD CUMANA PHILIPS GOLDEN IMAGE NAKSHA ABACUS

ZYDEC GOLDSTAR HEWLETT PACKARD TOSHIBA CANON EPSON MITSUBISHI JVC PANASONIC DIGITA SEGA ABACUS NAKSHA GOLDEN IMAGE

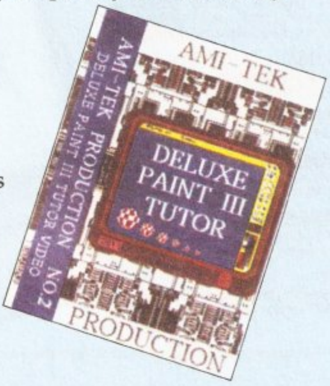
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16-32 Micro Programming AMOS, bimonthly fanzine, PD, (Fish->590) Membership 100FF/ £10 Contact F Moreau, 132 rue Jean Follain, 50000 Saint-Lo, France ☎ 31 52 20 02

Amiga Addicts Newsletter and open nights For more info SAE to A Minnock, Clonkelly, Binn, Co Offaly, Ireland

Amiga Artists Club 34 Roundhay Mount, Leeds LS8 4DW. For Amiga artists, musicians and coders. Pirates not welcome. Free. ☎ KAM on 0532 493942, 5-8pm.

Amiga Beginners' Club 110 Whitehill Park, Limavidy, Co. Londonderry, BT49 0QG. Club to help newcomers. Bi-monthly club disk, and a small PD library. Membership £2 for a single disk, or £20 for every issue.

Amiga Computer Club PD Library, graphics, video, DTP, monthly mag SAE for details to R McDonald, 3 Islay Court, Irvine, KA11 4JQ

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Amiga Network International 2 monthly club disk, reviews, advice For info contact Phil or Steve: 434 Denby Dale Rd East, Wakefield, W Yorks WF4 3AE

Amiga Users' Klub, Windsor House, 19 Castle St, Bodmin, Cornwall PL31 2DX. Meets every Friday from 6.30-9pm, to expand members' knowledge of Amiga and to help solve people's problems. Contact Jack Talling.

Amiga Users Group - FYLDE Advice on Amiga, technical support, discussions, workshops, tuition . £10 year, £6 6 months. Contact A Wilkinson, 25 Glen Eldon Rd, Lytham St Annes, Lancs ☎ 0253 724607.

Amiga Video Producers' Group Meets quarterly in Swindon. For info pack send SAE to J Strutton, 8 Rochford Cl, Grange Park, Swindon, Wilts SN5 6AB ☎ 0793 870667.

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Chester-le-Street 16-Bit Computer Club Ground floor function suite, The Civic Centre, Newcastle Rd, Chester-le-Street. Club meets Mondays from 7.30-9.30pm. Exchange advice and swap tips. Contact Peter Mears ☎ 091-385 2939.

CDTV Users Club Swap views on software and hardware. Contact Julian Lavanini, 113 Fouracres Rd, Newall Green, Manchester M23 8ES.

Chic Computer Club Full details with an SAE to STAMP, Chic Computer Club, PO Box 121, Gerrards Cross, Bucks. Contact Steve Winter ☎ 0753 884473.

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Club Futura Advice to programmers and beginners. Send SAE for info to G Holland, 16 Hermiston, Monkseaton, Whtiley Bay, Tyne & Wear NE25 9AN

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Computer Club 16 Laton Rd, Hastings, East Sussex ☎ 0424 421480. A 16-bit club dedicated to being computer enthusiasts Membership costs £15 per year.

Disabled Group (ICPUG) Contact David Bate, 71 Bedford Rd, Bootle, Merseyside L20 7DN.

Edinburgh Amiga Group Membership £5, includes free advice and PD. Contact Neil McRea, 37 Kingsknowe Road North, Edinburgh EH14 2DE with SAE.

Guru Masters PD, demos etc, contact the Sheriff, 111 Sherbourne Rd, Banbury, Wolverhampton, WV10 9EU ☎ 0902 782277

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In Touch Amiga Penpals, contacts, PD, swaps £2.50/year. Contact P Allen, 0342 835530, PO Box 21, Lingfield, Surrey RH7 6YJ

Independent Commodore Products Users' Group Biggin Hill Library, Church Rd, Biggin Hill, Kent. Meets most Thursdays from 7.45-9.45pm. Lectures and open nights. ☎ John Bickerstaff after 8.30pm 081-651 5436. Also national network of user groups. Contact individual groups for details on activities, cost, meeetings etc:
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Imagine Users' Group Encourages the use of Imagine and other ray tracing packages. Affiliated to US group. Object library. Membership free. Contact Brian Walker, 16 Cambridge Road, Newton Cambridge CB2 5PL.

Jam Bit Tech 24-hr hotline, PD library For info contact J Maron, Greycourt, Greycourt Cl, Idle, Bradford, BD10 8QH W Yorks ☎ 0274 611111 Ex 248

Kent Youth Computer Group Computer fair visits, programming, video and DTP work, monthly newsletter. 30p entry/evening. Meetings Sundays 6.30 - 9pm at the D Bowen Youth centre, Kingsnorth Road, Ashford, Kent TN23 2LY. ☎ 0233 629804

Maritime Amiga Club Maritime computing, interact with seafarers ashore on Amigas. Contact CDR K Osei, GN Ships Refit Office, 51 Rue de la Bretonniere, 50105 Cherbourg, France. ☎ 33 33225447

Northern Ireland Amiga User Newsletter, free PD library. Send SAE for further info. £5 annual membership. Contact: S Hamer, 98 Crebilly Rd, Ballymena, Co Antrim BT42 4DS

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Public Domain Exchange Demos, music, utilities, aimation Annual fee £8 Contact D McLeish, 26 Taunton Ave, Leigh, Lancs WN7 5PT

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Rye Computer Club Swap/meet at the Rye Community Centre. For info contact Oliver Campion, 71 The Mint, Rye, E Sussex TN31 7DP ☎ 0797 222876

Serious Amiga Users Membership £5, £1 admission. Contact J Kucak for more: ☎ 0706 290387. Fortnightly meetings 7.30-11 at the High Crompton Conservative Club.

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Software Exchange Service 13 Bournville Lane, Stirchley, Birmingham, West Midlands B30 2JY. Michael Pun ☎ 021-459 7576.

South Wales Club Newsletter, PD, advice. Contact D Allen 53 West Ave, Trecenydd, Caerphilly, CF8 2SF

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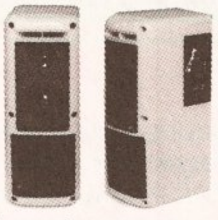
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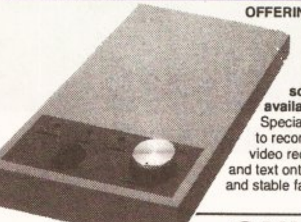


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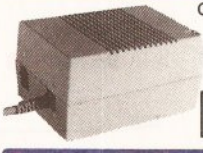
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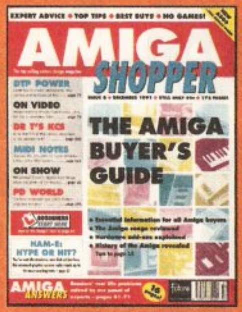
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You too can program

Programming has always been the preserve of the élite but Amiga Shopper is here to show that anyone can do it. This month we look at decision making, arrays, and make the first steps towards coding a noughts and crosses game

A computer's ability to make decisions – to perform a specific action depending on a given set of inputs – is the single component that makes it such a useful tool. When you're playing a game of Space Invaders, how does the computer know when to launch a missile from your space ship? It decides whether or not you are pressing the fire button, and whether you have any missiles left. The whole game is orchestrated by a network of decisions, as is just about every program written.

The word 'decision' is rather a misnomer: computers can't think, so they certainly can't 'decide' to do something. What they do is test the truth of something (eg is the fire button being pressed?) and perform a different set of actions depending on the outcome of the test.

So there are clearly two main parts to a programmed decision: the test itself, and the dependant actions to be performed. This is taken care of in Basic with the If and Then statements.

The test part of the decision is known as the condition. The test always yields a result of yes or no, termed 'true' and 'false'. Two values are compared in a condition. The values may be held in variables, or they may be written explicitly into the program as constants. There are a number of ways in which these values may be compared:

- **Equal** – this is expressed with the'=' symbol. If the two values are found to be equal, then the result of the condition is true, otherwise false.

- **Less Than** – is expressed with the '<' symbol. If the first value is lower than the second, then the condition is true.

- **Greater Than** – is expressed with the '>' symbol. If the first value is higher than the second, then the condition is true.

- **Not Equal** – is expressed with the '<>' symbols. If the two values are not equal to each other, then the condition is true.

In addition, the greater than and less than symbols can be combined with the equals symbol:



- **Less Than Or Equal** – is expressed with the '<=' symbols. If the first value is lower than or equal to the second, the condition is true.

- **Greater Than Or Equal** – is expressed with the '>=' symbols. If the first value is higher than or equal to the second, the condition is true.

These comparative symbols appear between the two values to be tested:

```
If A<5 ...
```

means that if the value in A is less than five, the condition will be true.

The second part of the decision is the consequence. This is executed if the condition was found to be true. It is expressed with Basic's Then statement, followed by the required action (expressed as another Basic statement). For example:

```
If A<5 Then Print "The ↵
variable A has a value of ↵
less than five"
```

will print out the text in quotes if the value in A is less than five. In last month's article the If statement was used with Stop to halt a program if a dummy value was entered. In fact, any Basic statement can be used, opening up a range of possibilities.

USER ABUSE

It may well be that your program requires more than one statement to be executed if a condition is true. Imagine a program which gives the user a list of, say, five options to choose from. It expects the user to enter a number between one and five to indicate the required option. There is a possibility that the user, being the awkward soul that users can be, enters a number outside this range. In this case, it would be nice if the program could print out an error message and then give the user another go at entering the number.

The condition is a little more complicated in previous examples. Suppose that the user's number is stored in the variable OPTION. We must test whether option is less than one, and also whether it is greater than five. If either one or the other of these tests turns out to be true, we know the user has made a mistake and that something has to be done about it....

Two tests can be joined in the same condition by means of the And and Or keywords. With the And keyword, the condition is only true if both tests are true. We could write:

```
If OPTION<1 AND ↵
OPTION>5 Then...
```

This wouldn't make much sense: OPTION can never be both less than one and greater than five, so the consequence of the decision would never be executed. What we need for our example is Or:

```
If OPTION<1 Or ↵
Option>5 Then...
```

which will only prove true if the user has entered a value outside the correct range.

There are a couple of ways to tackle the consequence of the decision. Here is the simplest (and most messy):

```
AGAIN:
Input "Enter your ↵
option";OPTION
```

```
If OPTION<1 Or OPTION>5 ↲
Then Goto MISTAKE
Print "You selected ↲
option:";OPTION
Stop
MISTAKE:
Print "Sorry, only values ↲
between one and five are ↲
allowed"
Goto AGAIN
```

Firstly, the program prints a message and gets the user's input into the variable OPTION. The next line then checks to see if the retrieved value is outside the permitted range. If it is, control jumps to the part of the program labelled MISTAKE. Here, an error message is displayed and another jump is made to the AGAIN label, where the user is given another chance to make a correct entry.

If the value of OPTION is within the permitted range, then the consequence of the decision is ignored and control passes straight on to the next statement, which prints out a message of confirmation and halts the program. In reality, of course, this section of code would do something dependant on the option chosen by the user.

This solution makes two uses of the Goto statement. As you can see, it starts to complicate things because control is jumping all over the place for no good reason: this is the spaghetti effect which causes so many programmers to spurn the Goto statement altogether.

A slightly more elegant method can be achieved by putting more than one statement on a line. Most Basics, AMOS included, enable the program to put two or more statements on one line so long as they are separated by a colon (:). Normally, this doesn't offer any advantages, and can make code quite difficult to read, but if used after a Then keyword it means that several actions can be performed by a single If statement. The result looks like this:

```
AGAIN:
Input "Enter your ↲
option";OPTION
If OPTION<1 Or OPTION>5 ↲
Then Print "Sorry, only ↲
values between one and ↲
five are allowed" : ↲
Goto AGAIN
Print "You selected ↲
option:";OPTION
Stop
```

As you can see, we've managed to eliminate two lines and one Goto statement without making the program any more complicated.

ARRAY OF HOPE

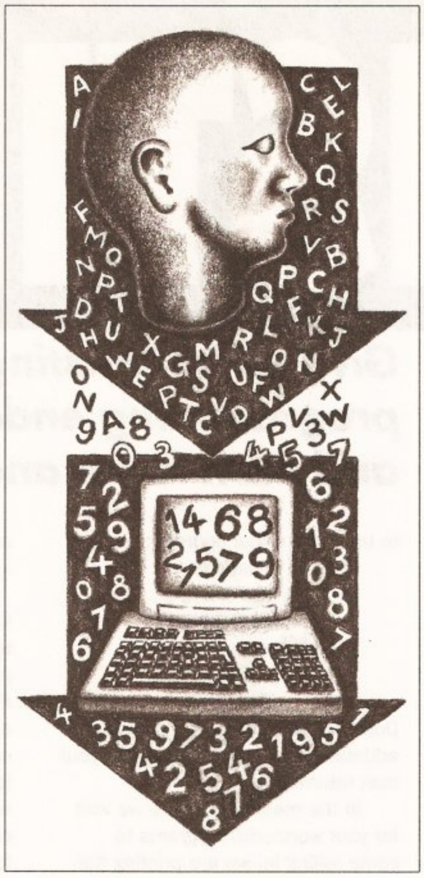
That's quite enough of decisions for now (they always make my head hurt): it is time to move on to the subject of arrays.

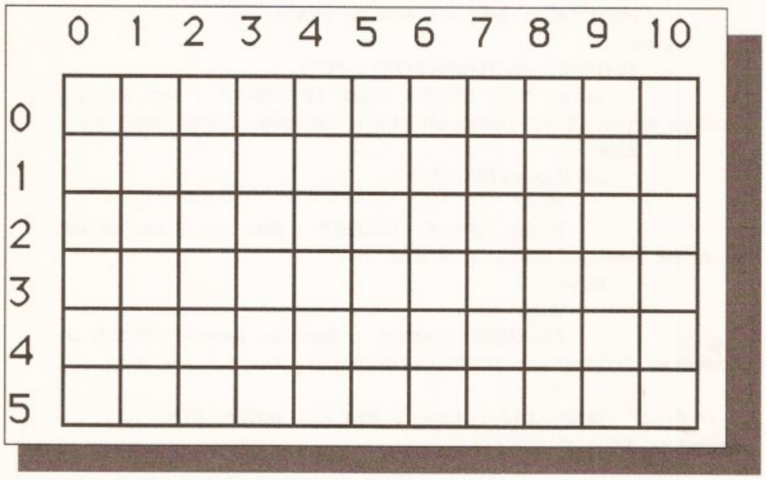
Arrays are an extended form of variable but, whereas a variable contains only one value, an array may contain several. An array has a size corresponding to the number of values it may hold. Each array used in a program must be properly set up with its size before it can be further used. The process is called 'dimensioning the array', and is done with the Basic Dim statement:

```
Dim A(10)
```

will set up an array called A, capable of holding eleven values, each of which is known as an 'element' of the array. What!? Eleven values! Yes, for reasons best known to the designers of Basic it was decided that the number of elements in an array would be one more than the number used in the Dim statement.

Having an array with a number of elements is not much use if the elements can't be accessed individually. This is done by following the array name with a number in brackets. The number corresponds to the element in question, with numbering starting at zero and ending at the number used when





A 2-dimensional array can best be thought of as a grid. Each square represents an element which holds a value, accessed by using both coordinates

dimensioning the array. For example:

```
A(5)=7
```

would store the value 7 in the sixth (because A(0) is the first element, remember) element of the array A.

N-DIMENSIONAL SPACE

The array above is said to be one-dimensional, but is possible to have multi-dimensional arrays. Consider:

```
Dim A(10,5)
```

Here we've created a two-dimensional array. For each of the left-hand indices of the array (A(0), A(1), A(2) and so on), there are six further indices – A(0,0), A(0,1), A(0,2) and so on. It's similar to the coordinates on a graph (or the Amiga's screen, come to that). Both numbers are necessary to access a particular element from the possible 66 in the array. It's easiest to understand if you visualise the array as a grid.

BACK TO REALITY

At the moment, you may well be thinking that arrays are a pretty strange concept. They are all very well, but why use them instead of ordinary variables?

Well, arrays really come into their own when used along with the For/Next loop mentioned last month. The best way to get a feel for them is by implementing them in a 'real-world' program.

The program we're going to have a look at is one to play noughts and crosses. But let's not jump right in there immediately. It is usually a good idea when writing a program to break the task up into a number of stages, then write and test the code for each stage in turn.

OK, so what constitutes a noughts and crosses program? For a start, we need to have some description of the board, in which the program can keep track of which squares are empty, which are filled with a cross and which are filled with a nought. This is where our array comes in.

In addition, we need some code to draw the board on the screen. The other main section is the bit which gets the player's move, checks its validity and alters the board accordingly (we'll leave out the code for playing against the computer for the time being). Obviously, there are a couple of other bits and bobs which will have to be included to join the main parts together, but that is essentially that.

We'll tackle the representation of the board first.

Since noughts and crosses is played on a three-by-three grid, it seems sensible to store the contents of the board in a three-by-three array:

```
Dim BOARD(3,3)
```

Next, we need to decide which format the data will take. For noughts and crosses, there are 3 possibilities: a square can be empty, it can contain a cross, or it can contain a nought. So, what about 0 for empty, -1 for a cross and 1 for a nought?

Having decided this, we must first make sure the board is blank at the beginning of the game. A zero must be stored in each of the elements of the array in turn. This is how it's done:

```
For X=1 To 3
   For Y=1 To 3
       BOARD(X,Y)=0
   Next Y
Next X
```

Here we've set up two loops, one inside the other. The value of X goes from one to three. For each value of X, the value of Y goes from one to three. These variables are then used as indices to access the elements of the array BOARD. Think of X as representing the position across the board, and Y as the position down the board.

That's all there's space for this month. Next month we'll go into the code behind displaying the board and getting a move from the player. Until then, have fun experimenting. AS

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In the meantime, while we wait for your wonderful programs to come rolling in, we are printing the result to *Cliff's Code Conundrum* set in the January issue.

You may remember (it was a long time ago, but space has been tight) that the task was to write a program which acted as a *Reverse Polish* notation calculator. With such a calculator, two operands are entered before the operator which is to apply to them. In other words, to add 7 and 6 together, you would enter the two numbers first, followed by a plus sign.

The winning entry is by Mark Cooper, from Doncaster in South Yorkshire. His program solves the problem in a structured manner, creating a display which is both attractive and clear.

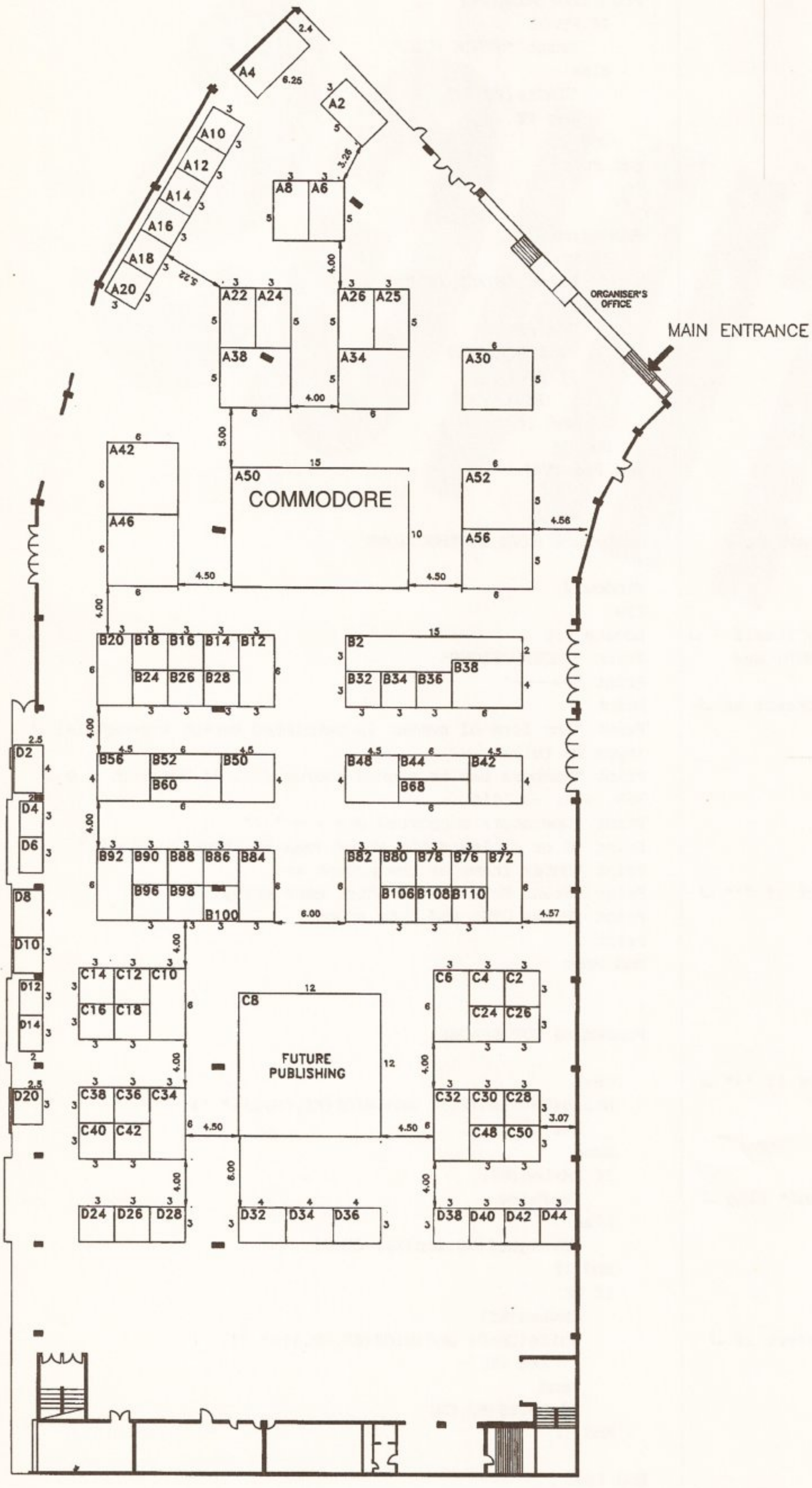
Well done, Mark – you'll be receiving your £50 prize soon. And many thanks to the rest of you who contributed to such a high standard of entries.

Bye for now, and don't forget – get those listings rolling! AS

```
'* Reverse Polish Calculator *
'* by Mark A.Cooper *
'
'* Notes: This program utilises an array, STACK(50), ↲
implemented *
'* as an, erm, stack! (The max. dimension of STACK can, *
'* of course, be changed as appropriate) *
'
'
Screen Open 0,640,256,2,Hires
Palette $0,$FFF
Hide
Wind Open 1,0,0,78,4,1
Wind Open 2,0,32,79,23,1
Window 1 : Print "REVERSE POLISH CALCULATOR" : Wait 100
Window 2 : Print "  "
'
' >>> Initialise variables <<<
Dim STACK#(50)
Global STACK#(),PT,OK,TYPE,NO$,OP$,K$
PT=1
'
GIVE_INSTRUCTIONS
'
Do
'
' >>> Display stack status in upper window <<<
'
   Window 1
   Print "Items on stack: ";PT-1;"  "
   Window 2
   TYPE=-1
'
' >>> Collect input from user and validate <<<
'
   Input "=> ";K$
   CHECK_OK
'
' >>> Take necessary action according to validity and entry ↲
type <<<
'
   If Not OK
      Print "Error in input"
   Else
      If TYPE<3
         Z#=Val(K$) : Rem >>> TYPE 1 = +ve digit; TYPE 2 = ↲
Signed real or integer <<<
         PUSH[Z#] : Rem >>> Add to stack <<<
      Else
         If(PT<3) and(Upper$(K$)<>"C")
            Print "NOT ENOUGH ITEMS ON STACK" : Rem >>> ↲
Declare error if <2 items on stack (unless cancelling) <<<
         Else
            If Upper$(K$)="C"
               PT=1
               Print "STACK CLEARED" : Rem >>> Clear stack ↲
to avoid leaving results behind <<<
            Else
               PULL
               OPERAND2#=Param# : Rem >>> Remove SECOND ↲
parameter from stack (LIFO, remember?) <<<
               PULL
               OPERAND1#=Param# : Rem >>> Remove FIRST ↲
parameter from stack <<<
'
' >>> Perform correct operation <<<
'
               If K$="+"
                  ANSWER#=OPERAND1#+OPERAND2#
               End If
               If K$="-"
                  ANSWER#=OPERAND1#-OPERAND2#
               End If
               If K$="*"
                  ANSWER#=OPERAND1#*OPERAND2#
               End If
               If K$="/"
                  ANSWER#=OPERAND1#/OPERAND2#
```

```
            End If
'
' >>> Display answer - and PUSH it onto stack <<<
'
            Print : Print ANSWER# : Print
            PUSH[ANSWER#]
         End If
      End If
   End If
End If
Loop
End
'
'
Procedure CHECK_OK
'
CUT_SPACES
'
   NO$="0123456789" : OP$="+-*/.cC"
   OK=True
'
' >>> Check for illegal characters <<<
'
   For I=1 To Len(K$)
      If Instr(NO$+OP$,Mid$(K$,I,1))=0
         OK=False
      End If
   Next
'
   If OK
      If Len(K$)=1
         If Instr(OP$,K$)=0
            TYPE=1 : Rem >>> +ve digit - flag correct as ↵
TYPE 1 <<<
         Else
            If Instr(OP$,K$)=5
               OK=False : Rem >>> Decimal point by itself - ↵
flag as incorrect (can be equivalent to EMIT in FORTH) <<<
            Else
               TYPE=3 : Rem >>> Operator - flag correct as ↵
TYPE 3 <<<
            End If
         End If
      Else
         For I=1 To Len(K$)
            P=Instr(OP$,Mid$(K$,I,1))
            If(P=3) or(P=4) or(P=6) or(P=7)
               OK=False : Rem >>> Flag as incorrect if "*" ↵
"/" "c" or "C" embedded <<<
            End If
         Next
'
         For I=2 To Len(K$)
            P2=Instr(OP$,Mid$(K$,I,1))
            If(P2=1) or(P2=2)
               OK=False : Rem >>> Flag as incorrect if "+" ↵
or "-" anywhere except beginning <<<
            End If
         Next
'
         DP=False : Rem >>> Set "Decimal point found" flag ↵
as False <<<
         For I=1 To Len(K$)
            CH$=Mid$(K$,I,1)
            If CH$="."
               If DP
                  OK=False : Rem >>> Flag as incorrect if ↵
more than one decimal point found <<<
               Else
                  DP=True
               End If
            End If
         Next
         If OK
                        TYPE=2 : Rem >>> (Signed) number - flag correct ↵
as TYPE 2 <<<
            End If
         End If
      End If
End Proc
'
'
'
Procedure PUSH[V#]
   If PT=51
      Print "STACK FULL"
   Else
      STACK#(PT)=V#
      Inc PT
   End If
End Proc
'
'
Procedure PULL
   If PT=1
      Print "STACK EMPTY"
   Else
      Dec PT
      V#=STACK#(PT)
      If PT<1
         PT=1
      End If
   End If
End Proc[V#]
'
'
Procedure GIVE_INSTRUCTIONS
'
Window 2
Clw
Locate 0,0
Print "INSTRUCTIONS"
Print "————"
Print
Print "Any form of number is permitted except exponential ↵
(type in full)"
Print "Numbers can be signed and/or real if desired, e.g ↵
365, +32, -3.141"
Print "Operators supported are + - * /"
Print "C or c clears the stack (max 50 items on stack)"
Print "Enter items at the prompt =>"
Print "Press Enter or CR after each entry"
Print "Press CTRL and C to stop"
Print
End Proc
'
'
Procedure CUT_SPACES
'
   CH=1
   While(CH<=Len(K$)) and(Mid$(K$,CH,1)=" ")
      Inc CH
   Wend
   If CH>Len(K$)
      OK=False
   Else
      K$=Right$(K$,Len(K$)-CH+1)
   End If
   If OK
      CH=Len(K$)
      While(CH>0) and(Mid$(K$,CH,1)=" ")
         Dec CH
      Wend
      K$=Left$(K$,CH)
   End If
'
End Proc
```

This is where



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it's at, baby

WHO'S WHERE...

Company	Stand
16/32	C16
Alternative Image	B70
Amiga Warehouse	A46
Ashcom	B100
AVR	D6
Bare Necessities	B112
Bitcon	D32
Bruce Smith Books	B60
Care Electronics	D4
Checkmate Digital	D38
Citizen	A16
Commodore	A50
Computer Disks & Ribbons	B42
Computer Express Europe	B48
Computer Manuals	B52
Computer Mates	A36
Connect	A28, D34
Cortex	D10
Database Direct	B68
Dial A Disk	C14
Digita International	B12
Dynamite	B106
Entertainments International	D8
Future Publishing	C8
Future World	A52
GVP	A26
Gasteiner	B50
George Thompson	A4
Golden Image	B50
Hard and Soft	B58
Harpers	B18
Hi Soft	A6
Home Computer Club	D20
JAM	A3
Kador	A2
LDG	A10
Logic Sales	C26
Mail Order	B32
MC Dist	B84
MD Office	B72
Nasa Promotions	D12
NC Entertainments	B56, C6
New Dimensions	D14
PD Soft	A1
Pictureware	A12
Power	A44
Progressive Peripherals	A32
RGB	D28
Rombo	B82
Roßmöller	B86
Silica	B2
Siren Software	B14
Snap	D2
SoftStore	D16
Supra	A30
Swift Micros	C2
Syntronix	A22
Videk	B44
Waxride	C10
We Serve	A38
WTS	B16
Zone Distribution	A34

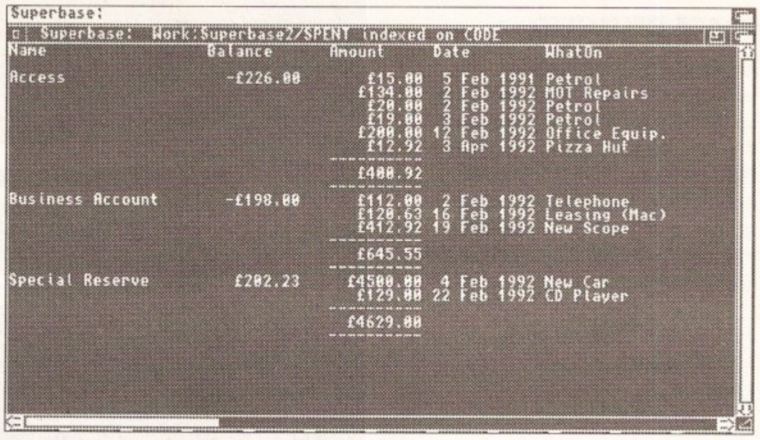
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- Find out how to get the very best from your set–up in a series of seminars by industry experts
- Meet the *Amiga Shopper* editorial team and tell us just where you think the magazine ought to be going
- Meet Damien Noonan of *Amiga Format* and Matt Bielby of *Amiga Power*
- Slip into the Amiga Power Arcade for some serious games!

If you're unsure how to make certain you stay in the black, take a look at the tips on page 142 on how to create a database with *Superbase Personal 2*. Keep your bank manager happy with this simple but effective system



Despite its power, Superbase Personal 2 does have some shortcomings, Mark Smiddy reveals all. Plus: the secret of a healthy bank balance

Put it on the account

The first two parts of this short series have demonstrated how easy it is to create complex multi-file databases and retrieve just the information you need. That, however is not the end of the story; and I would like to complete this introduction to *Superbase* by examining how to share your data with other applications, including databases, and explain some of the practical pitfalls which should be avoided. (Many of the maladies can be cured by upgrading to *Superbase Professional*.) We'll finish off with a short example on creating a database to help you keep an eye on your credit card outgoings.

Now let's assume you already have some data in another database (even the AmigaDOS database described elsewhere in this magazine) and want to process it in *Superbase*. That is hardly an unreasonable request – but the system of swapping data between applications can be a real chore. Fortunately, *Superbase* provides several means of swapping data: the simplest for general purpose files being SDF and CDF. For most purposes you will use a variation of CDF – or Comma Delimited File – so let's take a look at that one first.

As you should be aware by now, any *Superbase* database file is made up from a series of records; where each record contains one or more fields. Take a simple address database defined like this:

```
FirstName   TXT   10
LastName    TXT   20
Street      TXT   30
Town        TXT   20
County      TXT   20
Postcode    TXT   8
```

Each of these "fields" is present for every record in the database (even though some fields may be blank in some records). So, let's take an example:

```
Firstname: Future
LastName: Publishing Ltd
Street: 30 Monmouth Street
Town: BATH
County: Avon
Postcode: BA1 2BW
```

In reality, the *Superbase* file contains something like this:

```
Future Publishing Ltd..... ↵
30 Monmouth Street..........↵
BATH........... ↵
Avon................ ↵
BA1 2BW
```

The "."s in this output represent padding characters where the data does not completely fill the field. A separate file is used to hold the actual file definition shown above.

The idea of SDF and CDF formats is to divorce the data from its parent definition and create a usable file. By default *Superbase* looks for two delimiters (separators) the comma – ASCII 44 – and the line feed – ASCII 10 – although these can be changed as you'll see shortly. Each field is separated by a command and each record is separated with a line feed:

```
Field1,Field2,Field3… ↵
{record #1}
Field1,Field2,Field3… ↵
{record #2}
Field1,Field2,Field3… ↵
{record #3}
```

Therefore, the address defined above could be written in CDF:

```
Future Publishing Ltd,↵
30 Monmouth Street, ↵
BATH,Avon,BA1 2BW
```

Note however, there are no spaces between the text and the punctuation – this is important if you are defining an ASCII file ready for importing especially since a few stray spaces can cause truncation and halt the import. Something else to note with CDF is that blank records *must* be delimited too:

> ***"Superbase seems at first glance to be a few bytes short of a RAM expansion."***

```
Field1,,Field3… {record #n}
Field1,,Field3… {record #n+1}
```

Each time *Superbase* reaches a comma it skips to the next field and reads data into that one, so if the extra comma was missing the data intended for Field 3 would end up in Field 2. This error will rattle through all the fields up to the end of the record.

• EXERCISE 1
Why?
(The answers are on page 142).

• EXERCISE 2
The following CDF record will not fit in the previous definition, why?

```
Future Publishing Ltd,30, ↵
Monmouth Street,BATH,Avon,↵
BA1 2BW
```

CDF Files crop up all over the place but they are not always convenient – as the previous exercises demonstrate.

Another solution is to change the field (possibly even the record delimiters) to something which does not occur naturally in the database. *Superbase* allows for this contingency from the Set...Options requester; but pre-supposes that:

- the software performing the import/export also allows this facility.

- you have an ASCII chart to hand (44 is ASCII for a comma).

SPACE DELIMITED

An alternative method also supported by *Superbase* seems at first glance to be a few bytes short of a RAM expansion. Space Delimited Files (SDF) have the fields split up with blank spaces; but as daft as it sounds this method can be very efficient. One record in a typical file might look like this:

```
Future Publishing Ltd      ↵
30, Monmouth Street        ↵
BATH          Avon         ↵
BA1 2BW
```

The idea here is that each field occupies a specific amount of room – and that remains constant for every record in the file – SDF can be thought of as being Size Delimited. Therefore, if every field is padded out to full size with spaces then field and record delimiters are not required. When *Superbase* reads this, it uses the field widths set in the file definition to decide how many characters belong in each field. Since the record size is decided by the sum of the number of characters in all the fields, a record delimiter is not required.

The advantage of this method over, say, CDF is that you don't need to worry about the application getting confused because a delimiter is defined in one or more fields in one or more records. The disadvantage is less obvious: CDF works out for itself where a field/record begins and ends – SDF cannot. The field and file definitions of both exporter and importer *must* be identical or the entire database will be completely garbled.

To sum up:

- CDF ignores field length, but is prone to delimiter errors.
- SDF is indifferent to delimiter errors but the receiver's file definition is critical.
- An error in CDF-import is usually restricted to one record.
- An error in an SDF-based import affects all records downstream from the error.

As an exercise you should attempt to prove both these assertions by exporting, editing, and importing an SDF and CDF file. As a parting note, you should be careful attempting to use CDF files from other systems since records are often delimited with an ASCII 13.

CLEANING UP IMPORTS

Importing files from other databases using CDF is not a very exact science. Inevitably; any large database – especially one created using a spreadsheet or word processor – will contain extra spaces. While these may not be clear on screen they will almost certainly affect any queries you define. Therefore, the first operation you should perform is to globally remove all those spaces. Doing this manually is a daunting prospect – and as vulnerable to error as the blind (unvalidated) data entry itself. *Superbase* provides a neat workaround in the form of the Process...update option. (What I'm about to describe can be used on any database, but such cleaning up should normally be programmed into the file definition itself).

1. Select Update...Edit from the Process menu and click OK on the Filter box. This is necessary to ensure the operation works on all records in the database.

2. Enter the following for each field – substituting your fieldnames for the ones given here. (This is best done using the requester supplied with *Superbase*.):

```
File.Field1 = LTRIM$( TRIM$ ↵
(File.Field1): File.Field2 ↵
= LTRIM$( TRIM$ (File.Field2)
```

3. The number of fields that can be trimmed in one operation is limited by the number of characters on the line – so you may have to do this several times for all the fields. Each operation must be separated with a colon.

EXERCISE 3

The operation just described only applies to text fields. Why?

OTHER FORMATS

SDF and CDF should only be used as a last resort because they are prone to error and difficult to use. Many applications will support one or more of the following protocols: *DIF*, *DBase II*, *DBase III* and *Lotus 1-2-3*. *DBase II* and *III* are the file formats used by Ashton-Tate's hugely successful, "industry standard" database – which goes by the staggeringly uninspired name *DBase*. (*DBase I* never existed by the way, the "II" in the title was a neat marketing trick to imply a track record and history it never had.) *Lotus 1-2-3* is another industry standard protocol, belonging to a spreadsheet, which is useful if you want to swap data with spreadsheets such as *Analyse*, *The Advantage* or *K-Spread*.

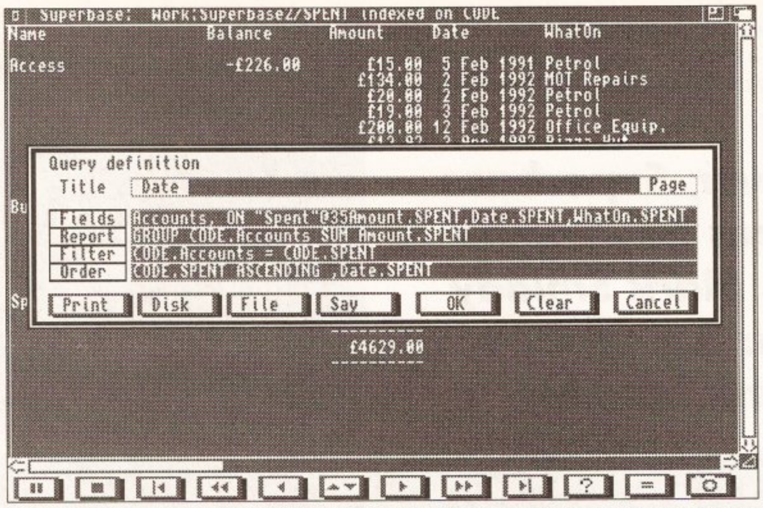
> **"DBase I never existed, the II in the title was a neat trick to imply a track record it never had."**

DIF is the odd one out and is not widely supported in the Amiga world. To my knowledge only Kuma and Precision (as was) supported it. Like IFF, it defines a standard set of rules which allow data to be transferred easily between different packages in different environments. If you have the option, *DIF* should be preferred to SDF or CDF however.

DANGER! UPDATE AT WORK

I mentioned *Superbase*'s Update function previously doing what it does best – cleaning up dirty imported files. However, there is a temptation to use this function to perform periodical updates of other information. Indeed, *Superbase* fully

continued on page 142



If you're not so handy with figures, try being ultra-organised and let *Superbase Personal 2* look after your cash flow – but don't blame us if your incomings are still always greater than your outgoings, that's just the way of the world...

JARGON BUSTING • JARGON BUSTING

ASCII – American Standard Code for Information Interchange. A standard binary numbering system almost universally accepted as the way to describe characters as 8-bit numbers. There are 256 combinations: 31 special characters starting from 0; punctuation from 32 to 64 and the alphabet starting at 65 for a capital "A".

CDF – Comma Delimited File. See main text.

Database – A collection of one or more records.

DIF – Data Interchange Format. A standard format used to transfer data between different applications. The idea can be likened to IFF – but the two should not be confused.

Export – Processes and stores a collection of data so it can be accessed by another application.

Field – A blank area in a database record used to hold data. Fields are usually categorised by the type of data stored in them: text, numbers, dates and so on.

Import: – Retrieve data from another application.

Index – A list of pointers. A normal index holds one pointer for every non-unique indexed record in the database. A unique index contains one value (key) for every record in the database.

Key – An index pointer. Put simply, a value calculated from a field's contents. A collection of keys is called an index.

Query– *Superbase*'s name for a report.

Record – A collection of one or more fields.

Relational database – A more powerful form of database where information can be retrieved and collated from two or more database files.

SDF – Space Delimited File. See main text.

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SILICA STARTER KIT £25
TOTAL VALUE: £255
SAVING: £66
SILICA PRICE: £189

£189
+VAT= £222.08 ref: PRI 2319

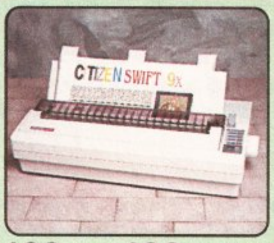


192 CPS — 80 COLUMN

- *Citizen Swift 9 - 9 pin - 80 column*
- *192cps Draft, 48cps NLQ*
- *8K Printer Buffer + 3 Fonts*
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192 CPS — 136 COLUMN

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- *192cps Draft, 48cps NLQ*
- *8K Printer Buffer + 3 Fonts*
- *Parallel Interface*
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SAVING: £337
SILICA PRICE: £269

£269
+VAT= £316.08 ref: PRI 2544

24 PIN PRINTERS

NEW!



192 CPS — 80 COLUMN

- *Citizen 224 - 24 pin - 80 column*
- *192cps Draft, 64cps LQ*
- *8K Printer Buffer + 4 Fonts*
- *Parallel Interface*
- *Graphics Resolution: 360 x 360dpi*
- *Epson and IBM Emulation*
- *Colour Option Available*
- *FREE Silica Printer Starter Kit*

RRP £269
SILICA STARTER KIT £25
TOTAL VALUE: £294
SAVING: £95
SILICA PRICE: £199

£199
+VAT= £233.83 ref: PRI 2484



192 CPS — 136 COLUMN

- *Citizen Swift 24x - 24 pin - 136 column*
- *192cps Draft, 64cps NLQ*
- *8K Printer Buffer + 4 Fonts*
- *Parallel Interface*
- *Graphics Resolution: 360 x 360dpi*
- *Epson, IBM and NEC P6 Emulation*
- *Colour Option Available*
- *FREE Silica Printer Starter Kit*

RRP £489
SILICA STARTER KIT £25
TOTAL VALUE: £514
SAVING: £165
SILICA PRICE: £349

£349
+VAT= £410.08 ref: PRI 2574

INKJET PRINTER

NEW!



360 CPS — 80 COLUMN

- *Citizen Projet - inkjet - 80 column*
- *360cps Draft, 120cps NLQ*
- *50 Nozzle Head - Whisper Quiet 47dB(A)*
- *8K Printer Buffer + 3 Fonts*
- *Optional HP Compatible Font cards*
- *Parallel Interface*
- *Graphics Resolution: 300x300dpi*
- *HP Deskjet plus emulation*

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SAVING: £137
SILICA PRICE: £359

£359
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continued from page 140

supports this and the manual goes into some depth on the possibilities. But it does not clearly outline the dangers.

Assume if you will, a stock control system. This might consist of two basic databases: items Held and items Sold. Initially the Held database contains descriptions and quantities of all the items in the inventory. Similarly, every record in the items Sold database shows what was sold and how many.

In order to update the inventory (Items Held) you would link the two files relationally in the Update filter, like this:

```
CODE.Held = CODE.Sales
```

and update the file viz:

```
InStock.Held = (InStock.↵
Held - Sold.Sales)
```

This works very well – but it has a very serious flaw: what happens if the update is called twice? Nasty that – you could end up with a minus figure in the inventory. In practice the solution is to clear the sales file (discarding the data) once it has been accessed. The Update becomes:

```
InStock.Held = (InStock.↵
Held - Sold.Sales): ↵
Sold.Sales = 0
```

Each item has a unique stock reference (Held.CODE), but can exist many times in the Sales file. This could be used to keep track of a series of transactions – although it also makes sense to produce a report based on the sales transactions *before* running the update and deleting them forever. Such data could also be used to track how individual items are selling on a daily, weekly or monthly basis.

This approach suffers from another problem which may not be immediately obvious: the active Sales file will get filled with redundant information very quickly. Such information can be disposed of easily using the Process...Remove facility. Given the previous example, it is only necessary to work on the flat file, Sales database, using a filter like this:

```
Sold.Sales = 0
```

... in other words, delete all the records which have been processed into the inventory system.

HOME ACCOUNTS

From a home user's point of view, this is not a lot of use – but the same technique can be applied to more critical topics, credit cards for instance. Keeping track of spending is something which causes a lot of aggravation. Credit cards are typical – if you don't keep a careful eye, it's easy to go over those limits. (Before going on, I should say the definitions supplied here are primarily for example. They require a lot of will-power to update on a regular basis; without which they are useless.)

To keep things simple, I have split this into three related databases – each with its own set of rules. By following the examples thus far, you should be able to build on this idea and generate a far more friendly version. What counts are the techniques involved; the rest is merely icing on the cake. The three databases track: Spending; Payment and Account status as follows:

HOME ACCOUNTS DEFINITIONS

The main database is made up as follows:

ACCOUNT

Name	Attributes		Format		
CODE	TXT	REQ	IXU	5	U
AcName	TXT	REQ		20	
AcNumber	TXT	REQ		30	
Limit	NUM	REQ	$9999.99		

Quite simply, each account is assigned space for its name, account number and a limit which is intended to keep track of credit card spending and overdraft facilities. During initial setup, the limit should be set as follows...

- **Credit cards –** The total already spent as a debit (minus).
- **Other accounts –** The amount in the account. Overdrafts should be flagged as debits.

Two other databases are also required – one to keep track of spending and the other of any payments you make. These are simply:

PAID

Name	Attributes		Format		
CODE	TXT	REQ	IXD	5	U
Date	DAT	REQ	dd mmm yy		
Amount	NUM	REQ	$9999.99		

SPENT

Name	Attributes		Format		
CODE	TXT	REQ	IXD	5	U
Date	DAT	REQ	dd mmm yy		
Amount	NUM	REQ	$9999.99		
WhatOn	TXT	REQ	40		

Every entry in the Spent file has space reserved for the description of the item the money was spent on.

Of course this could, in itself, be a related database if you had a lot of fixed expenses.

Let's take the example of a sales rep, who would spend most of his time away form home. Typical expenses would be for: meals, petrol and so on. I have already demonstrated how to do this so I will not cover that ground again.

This database relies heavily on the Process...Update functions. Two updates are required.

Since the two updates remain the same from month to month, they should be saved to disk...

ANSWERS TO BRAIN TEASERS

EXERCISE 1

Since the fields are accessed sequentially, the missing comma causes data meant for Field 3 arriving in Field 2. The field pointer increments to Field 4 when the next comma is found and data for that field is entered into Field 3. This error repeats (and augments every time a comma is missed) until an End of Record delimiter is encountered at which point the field pointer resets.

EXERCISE 2

The extra comma (after 30 in the address line) causes the reverse effect described in Exercise 1 and the last field is lost.

EXERCISE 3

Numeric and Date fields are stored internally as numbers and are therefore, not prone to spurious spaces. In any event, those operations will only work on ASCII (string) data.

EXPENDITURE

The filter part is used to relate the money spent database to the main database like this:

```
CODE.Spent = CODE.Account
```

and the calculation is as follows:

```
Limit.Account = Limit.↵
Account - Amount.Spent: ↵
Amount.Spent = 0
```

PAYMENT

The filter and calculation for payment are similar:

```
CODE.Paid = CODE.Account
Limit.Account = Limit.↵
Account + Amount.Paid: ↵
Amount.Paid = 0
```

REMOVALS

Finally, a short Process...Remove is required to clear any records that have been updated – the filters are respectively:

```
Amount.Paid = 0
```

-or-

```
Amount.Spent = 0
```

Note: Once you have done this a few times, you should use Process...Reorganise to remove the deleted records completely and pack the file.

REPORTING...

The first two parts of this series covered the reporting facilities in some detail, so you should have some idea of how to get the data back out. In the interests of fair play though, here is a short query to get you started:

Fields

```
ON "Accounts"Name.Accounts,↵
Balance.Accounts, ON ↵
"Spent" @40 Amount.Spent,↵
WhatOn.Spent
```

Report

```
GROUP CODE.Accounts SUM ↵
Amount.Spent
```

Filter

```
CODE.Accounts = CODE.Spent
```

Order

```
CODE.Accounts Ascending
```

An interesting feature of this particular report is that it only displays those accounts which have been subject to activity. This is caused by the relational filter CODE.Accounts=CODE.Spent. If no spending entries exist for the acccount code in question, no relations are found and it is not displayed.

As an exercise you should try to devise some queries of your own to track account usage and what items attract regular use.

THE SHORTFALLS

This application of *Superbase* is not a complete accounts system because it does not take into account where funds come from. It blithely assumes, if you pay £1000 off your credit card, you must have got the cash from somewhere. In reality of course, it must come from somewhere and the onus is on you to tell it where from. This is a limitation caused by the lack of a programming language. To be honest though, for the difference in cost, I think I could put up with the minor irritation. AS

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GFA Forum. Anyone interested in exchanging programming ideas, code, hints, tips etc. ☎ John, any time. 0788 891197.

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Cumana Cax 10005 5.25" Amiga external disk drive, little used, £55. Amiga software £40. DG calc spreadsheet program £10. 5.25" Posso disk box £10. ☎ 0509 210157.

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A2000 3Mb RAM 2 x 3.5, 1 x 5.25 drives XT Bridecard 30MB HD Sony multisync monitor. Toshiba 80 col 24 pin printer, £1500 ono. ☎ Fran 0256 742075 (work) 0252 890350 (home).

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Amiga A500, 2.5Mb RAM, extra disk drive, colour VGA monitor, Trilogic Audio, two joysticks, loads of original software, manuals, mouse. £600. % 061 483 7770.

Serious and games software. Boxed and original. Inc Wordworth £65 Finest Hour £17 Superbase Personal £20. F Sim 2 £17. Battle Command £14. 0745 591432 after 3pm.

Astek G Compiler 3.6 (a) £50. Pascal Compiler 'metacomo' £50. Modula 2 Compiler £40. Music Studio £15. Cambridge 'Lisp' £30. Clip Art £20, + manuals. Sell separate or whole. ☎ 0602 765138.

Amiga 1500 mouse, 1Mb, 10845 monitor, 3 months, 60 disks - games, manuals, excellent condition, only £700. Contact L Hristakos, Bowland College, Lancaster University, LA1 4YT, ☎ 0524 65201 extension 2390 ask for Lik, Room B233.

Amiga 1500 with 5Mb, cost £900, mouse pad, mouse, good condition, hardly used, £370 or will swap for Amiga 500 with 1Mb and lots of games. ☎ 0939 233505 5pm - 8pm, ask for Ian.

Amiga KCS Powerboard PC emulator, £120. Amiga 500 joystick, software, Cumana drive, £250. Action Replay II £30. I also have 250 blank disks at 40p. ☎ Chris on 0947 83437.

Amiga A500 (1Mb), A590 fitted with 2Mb, 1084 monitor, second drive, joystick, TV tuner, loads of software. £600. ☎ 0635 37903 (after 6.30 pm).

25MHz Mega Midget Racer, 68030/68882 plus 2Mb 80ns DRAM, cost £750, sell £500. A590 with 1Mb installed, £220. Both boxed, as new. All reasonable offers considered. Phil Brown, 0372 729285.

Fatter Agnus 8372A. 1.5 Mb memory upgrade. Full instructs, easy fitting. Needs WB 1.3. Sell both together for £60 or will separate. DPaint 3 £10. Bill 0283 221780. A500 (1Mb) external drive, Rendale 8802 Genlock, video studio titling program. Brother M1009 printer. Lots of software DPaint 2 & 3. All manuals including "Amiga for Beginners". Will separate £525. ☎ 0425 479295.

Amiga 1500, Nexus hard card, 5 megs, 1084 screen, 24-pin Star printer, Amos 1.3, Deluxe Paint 3, sampler, works, games, also new SAS C 5.1 £1800, 0444 233272.

Amiga A500 A590 20Mb hard drive, 3Mb RAM Philips CM 8833 - II colour monitor with stand joystick optical mouse, much PD software. £600 ono. 081 870 8197 evenings and weekends.

A500 RAM expansion 4Mb + clock, can config to 1Mb chip RAM, £155. ☎ 0705 267540.

Amiga A1500 two drives. Under warranty. Supra quantum 52Mb hard drive Commodore memory card with 4Mb RAM. Commodore 10845 monitor. Midi interface boxed, manuals, software. £950. Portsmouth 0705 738647.

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GVP Series II hard drive 100Mb with 2Mb Simms. Two months old. £480 or best offer. ☎ 0584 810970.

A2000 GVP Combo 33MHz 030/82, 4MB, 105 Mb HDD, Panasonic multiscan 2 x 3.5 drives, flicker fixer, WB 2.04, two months old, £2000 ono. with HP Deskjet-C, £2400 ono. (Incl ECS). ☎ 0242 221577 (9 am - 4 pm).

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Amiga 1500 hard drive, Xetec fastcard + with 52Mb Quantum, 12 months warranty, £210. ICD ASCI controller, very fast, £80. Platinum Works, £30, Awsome, Obitus, K.G. Show, £10 each. ☎ 0733 243063 after 6pm.

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Amiga A500 1.3, Cortex 8Mb external expansion with PSU, 2Mb populated, external 3.5" drive. Vidi-Amiga, joystick and games, all boxed. £375 the lot. ☎ 081 653 0542 after 6pm.

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Understanding Advertisements

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Obviously it would be impossible for us to cover each and every new product that ever appears on the Amiga (there are just too many!). We try our utmost to cram as much into the magazine as space limitations will allow, but in the end it's up to you to make the buying decisions. We'll always try and help you to make the right choice, but with so many products being handled by several different suppliers, it would be impossible for us to keep a track of the best deals available.

It's equally important to remember that no advertiser will deliberately try to rip you off. They're obviously out to make a profit, but at the same time advertisers do want to feel that they've given you a good deal. After all, if you're satisfied with the service that they have provided, the chances are that you'll shop with them again. Do bear in mind, however that prices do fluctuate between suppliers, so never buy from the first advertisement that you read without first checking out what the rest have to offer.

As long as you follow a few simple guidelines, it's very simple indeed to find the best deal for your own personal requirements among the many advertisements featured within *Amiga Shopper*. Over the next two pages we hope to give you some idea of what to look out for. Keep the following points in mind before making your final decision to part with your cash, and we're sure that you'll not only get a good product, but you'll save money too!

1 Products such as hard drives and printers can be the source of many hours of frustration, so it's always worth buying new hardware and software from a supplier which offers some form of after-sales technical support.

While most suppliers will try their utmost to help you out if a problem does arise, a company which offers a technical support line will almost certainly have staff on hand who have detailed knowledge of the products that they offer.

2 By far the safest method of purchasing anything from a mail order supplier is by credit card. This provides you with insurance of a sort – if the company goes bust before you receive the products which you've ordered, you'll be able to claim back the money you have lost through your credit card company.

3 When buying a hard drive, don't automatically think or believe that all drives are fast. Some hard drives (the A590, for example) are notoriously slow, so always compare the performance of the hard drive you have in mind with others on the market.

The actual drive performance of a hard drive will usually be represented in terms of either access speed or transfer speed. In this particular case, an access time of 11 ms (milliseconds) is very good indeed.

4 With RAM expansions and hard drives that offer memory expansion capabilities, always check with the supplier how much it will actually cost to add extra RAM to the device.

To the uncautious eye the card itself may seem cheap, you could end up having to pay through the nose if the RAM chips themselves are expensive.

5 Another very important feature to look out for on any device which connects to the Amiga via a connector is a pass-thru port. In the case of RAM expansions and hard drives which connect to the Amiga via the bus-connector, the lack of a passthru connector will render useless other non-passthru devices (such as Datel's Action Replay cartridge), unless the drive or RAM expansion is removed first.

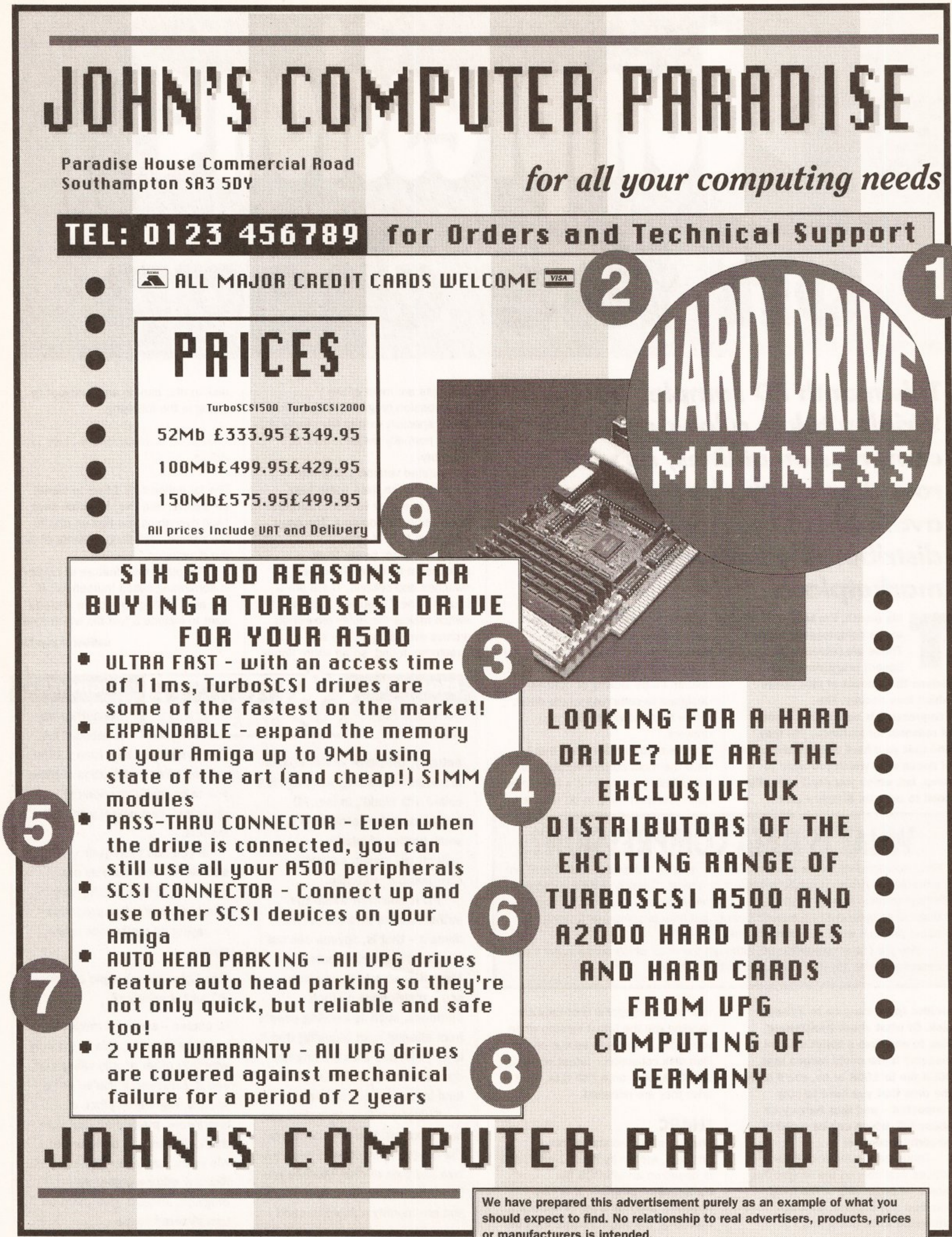
6 The majority of hard drives offer a SCSI connector these days, but there are a few that don't. Although this is not a necessity, you'll find the addition of a SCSI connector a must if you ever start to use scanners, other SCSI drives or tape streamers in the future.

7 Hard drives aren't as reliable as many users seem to think, so auto-head parking is a very important feature if you want to protect your data from head-crashes and read/write errors. Head parking moves the drive's head away from the disk surface, therefore ensuring that the two don't come into contact if your Amiga receives a knock.

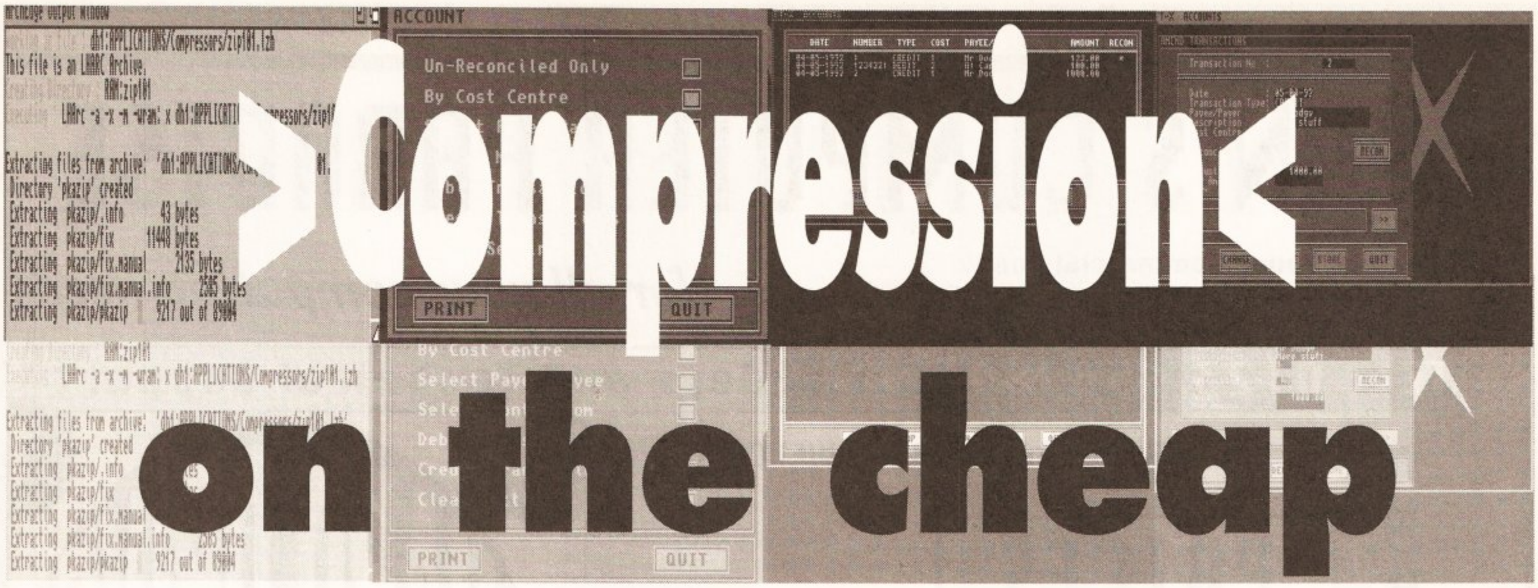
8 Warranties are very important indeed. Virtually all products give you at least a 1-year warranty, but the more years you get the better. On-site maintenance is by far the best, because the supplier will actually come to your home and repair the device, although this is rare unless you purchase the device from the manufacturers.

If you're buying a device which costs more than a couple of hundred pounds, you may be offered the chance to take out an extended warranty for just a few pounds – if you can afford it, this is a very good idea indeed as it will protect your investment for several years. To quote Alexi Sayle, "many products seem programmed to break down the very second that your warranty runs out!"

9 One important thing to check when comparing prices is that the prices which are quoted by the supplier include both VAT and delivery charges. Do watch out as some companies charge extra for delivery (as much as £10 on larger items!), so the saving that you appear to have made won't seem so great once VAT and delivery charges have been added on. AS



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>Compression< on the cheap

This month PD sampler Ian Wrigley takes a look at file compression utilities, as well as rounding up the best of what's available in the freely-distributable software marketplace

This month, I'm taking a look at file compression utilities. These are (normally CLI-based) programs which reduce the amount of disk space which files occupy. File compression is useful for a number of reasons: for instance, you may find that your hard disk becomes full of documents which you need to keep, but which you don't normally need to refer to. Simple – just archive them away on to a floppy disk. Or what about transferring files to and from a bulletin board by modem? If you could reduce that 200K file to 100K or so, you'll halve the time that you have to stay connected – and thus halve your phone bill, which can be a pretty powerful incentive!

There are a number of different utilities available on the Amiga; this month I'll be looking at the most common and popular, although there are bound to be some that I've missed. However, the selection covered should be capable of decompressing virtually anything you might come across. In a future column I'll be looking at utilities designed to compress whole disks, rather than individual files and drawers.

I've tried to make sure that I have the most current versions of the utilities, but again it's hard to be sure. The best thing to do is check with your PD supplier that they are sending you the latest version when you order. Also, keep an eye on the Fish disk collection – latest versions usually appear on a Fish disk soon after they are released.

LHARC

Lharc is a freely-distributable program, written by Paolo Zibetti, and is based on an MS-DOS file compression program. It is very powerful, and has a list of options a mile long. It's only runnable from the Shell (as are most of the compression programs, unless you use a specially-written front-end), and would normally reside in your C: directory.

I tested version 1.3 of the program, which fixes some bugs present in earlier versions, and also adds some new options. The basic command form is fairly straightforward; typing 'lharc' produces a listing of the major switches and options. There are a couple of neat features: using the '-r' switch makes the utility recursively archive everything in any sub-directories found, so an entire floppy disk in df1: can be archived just by typing in the following...

```
lharc -r a newarchive.lzh ↵
df1:*
```

The 'a' option tells *Lharc* to create an archive, and the '-r' switch says "Add everything you find on df1: to the archive, including contents of all the directories."

The other neat feature of *Lharc* is something called 'autoshow'. If you are creating an archive and you want to include a text file which must

continued on page 150

WHAT IS DATA COMPRESSION?

Data compression is the process whereby a file is reduced in size. There are a number of different methods to do this – most of which require a degree in maths to understand! Normally, you compress data to archive it on floppy disks or to upload it to a bulletin board, and then decompress it using the same program when you need it again.

Any file can be compressed, although the ones which produce the most impressive size savings tend to be text or pictures.

BEGINNERS START HERE

So what's PD, then?

Actually, the name of this column is a little misleading. Although it's called 'PD World', in fact PD (public domain) software is only a small portion of what's collectively known as 'freely distributable' software.

PD is software which the author has put into the public domain – that is, anyone can use it, alter it and redistribute it. Many software authors place some restrictions on their creations, such as banning people from altering it, or requiring that it is only shipped with the original documentation. Software of this kind is known as 'freeware'.

Shareware is a 'try before you buy' concept. You take a look at the program, use it for a week or two and then decide whether you like it enough to keep it. If you do, you are morally obliged to send the author his requested fee. This is normally less than £25 or so, and often registration entitles you to upgraded versions of programs, or a properly printed manual.

If you don't pay your shareware fees, authors are discouraged from putting any effort into upgrading programs – so paying up really does make sense!

Can I give other people copies of PD and shareware?

Of course – spread it around as much as possible; this is the only way that other people will get to see it. However, if you've got a special, registered piece of shareware, make sure that you don't give anyone that version. It's yours, and should be treated like any other commercial program. Instead, give them an unregistered version.

Crazy Joe's

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1948 MR POTATO HEAD CHIPS ARE UP! (P)* more adventure
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be read, you just make sure that the file's name ends with the extension '.txt.displayme', and when the archive is extracted the contents of the text file will automatically appear in a window. This is a great way for adding a copyright notice, giving instructions about how to run a program or whatever.

LHA

This utility, written by Stefan Boberg from Sweden, is shareware – he requests a fee of $20. For that you will receive a version of the program

> **"LhA is so sophisticated that you will only be using a tiny proportion of its utilities."**

with more features, such as the ability to create multiple-volume archives (that is, archives which are split across two or more floppy disks; this is very useful if you're trying to compress really big files).

The users' guide is extremely long – over 100K of text – but it pays to read it through at least once.

As usual, just typing 'lha' will produce a limited list of the options available, but this program is so sophisticated that you will only be using a tiny proportion of its facilities if you just go by what's displayed in the list.

LhA is compatible with *Lharc*, *LZ* and *LharcA* for the Amiga, and should be able (with only a couple of limitations) to decompress files which have been created with any of those utilities.

Unlike many of the other file compression programs, *LhA* allows you to set the speed of compression; the faster the compression, the larger the archive will be. However, you don't have to set this every time – the program defaults to a perfectly reasonable mid-way setting, and most users won't ever bother changing this.

ZOO

Zoo was originally written by Rahul Dhesi, and was ported to the Amiga by J Brian Waters, who asks for a $10 to $20 donation – although he says that "you should not feel guilty if you don't send anything." It is compatible with *Zoo* on both PCs and Unix machines.

Zoo isn't as sophisticated as some of the other programs available, and can sometimes be rather annoying to use. For instance, it seems to demand that all archives have a '.zoo' extension – so you have to rename any which don't.

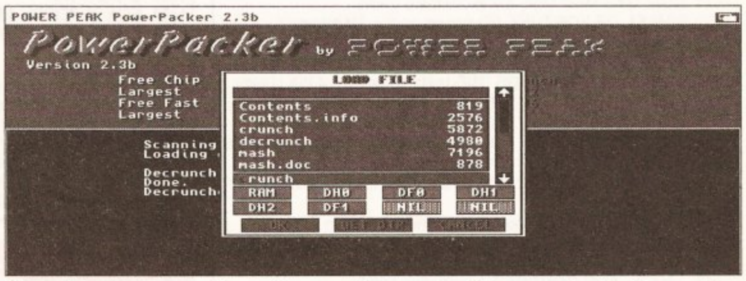
On the other hand, *Zoo* does have one neat feature: it supports both 'novice' and 'expert' commands. So, someone not used to the program can type in '-add' to add a file to an archive, while a seasoned user will instead type 'aP:'.

Not many people seem to use *Zoo* these days, but because it's fairly popular on the Unix and PC platforms, it's certainly worth having in your C: directory.

File compression utilities – speed tests

To test out the file compression utilities, we created a 'mixed bag' drawer containing an application, some text files and some IFF graphics. The total size came to 396K. We timed each of the compression utilities, both to compress and decompress the files, and we also measured the compressed file size. No other program was running while the files were being compressed/decompressed. The results are shown below; the percentage space saved is worked out by the formula 1 – (compressed size)/(original size). Note that *PowerPacker* was not included in the tests since it is not designed to compress collections of files – merely single files.

Program	Time to compress (secs)	Time to decompress (secs)	% size saved
Lharc	394	104	52
LhA	114	18	55
Zoo	182	95	39
PKAZip	263	48	52
LZ	184	66	54
AmigArc	311	169	35



PowerPacker may not have the most impressive file requester in the world, but it's still an incredibly popular file compression package

PKAZIP

Zip is probably about the most common file compression method used on PCs, so it's not surprising that a version has appeared for the Amiga. What is surprising, though, is that it is runnable from the Workbench (it has its own icon) and that it is Intuition-, rather than CLI-based. For this reason, it will be popular with people who aren't particularly happy with the Shell, or those who hate typing in full pathnames for every file that they want to compress.

The program, from the PKWare company, is shareware; $23 registers your copy, while if you send $43 or more (!) you will be sent the most current version of the program.

Setting up the program is perhaps a little awkward – you must copy three files to your S: directory before you start work – but once that's done, it is reasonably easy to use. One thing to remember is that when you want to compress a file, you must type in the name of the archive which you want to create – it's no use just specifying 'RAM:' as the destination, you must actually type 'RAM:myarchive.zip'. It's a shame that the program doesn't prompt you for the name of the archive, instead of just saying that it "Couldn't open destination file". Still, there is on-line help available if you want it.

Using a compressor from an Intuition window is far easier than having to cope with the command line – I'd recommend anyone to have a look at *PKAZip.*

LZ

Lz is by Canadian Jonathan Forbes, who asks that you send him a fee of $15 (Canadian or US Dollars). It is compatible with both *Lharc* and *LhA*.

Jonathan is clearly somewhat proud of the speed and compressed file sizes that *Lz* achieves – he makes the point about a dozen times that *Lz* is the fastest, most efficient and all-round best thing since sliced bread.

In use, *Lz* performs just like any of the other CLI-based compressors: just typing 'lz' produces an abbreviated help screen (it's nice to have a 'Press return to continue' message, rather than the text just scrolling off the top of the screen, though). The program is indeed fast – see the table for actual speed

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WHERE TO GET IT

There are two main ways of getting hold of PD and shareware for the Amiga: from a PD library or from a bulletin board.

There are many Amiga PD houses about; you'll see plenty of adverts here in *Amiga Shopper*, and we also print a list of PD houses on page 158. You should expect to pay anywhere between 99p and about £2.50 per disk, often with a discount if you buy a large number of disks at a time. Whether you go for the cheapest or not is up to you – larger and more experienced PD houses often have to charge slightly more because they are employing full-time staff, and include a catalogue with your order.

The advantage of getting software from a bulletin board is that you can be fairly sure it's the latest version – the people who use BBSs are serious enthusiasts, and always want the most up-to-date versions of everything. On the down side, though, you'll need a modem to connect (check out *Amiga Shopper*'s modem offer for a couple of reasonably-priced units). You'll also have to pay phone connection charges for the time that you are on-line.

There are a growing number of bulletin boards with large quantities of Amiga software available for download. Two good examples are 01-for Amiga (071 377 1358) and The Cheam Amiga BBS (081 644 8714). On the other hand, you could join up to CIX (Compulink Information eXchange), which caters for users of a vast range of computers, including the Amiga. There are also hundreds of conferences, ranging in subject from biking to pinball machines, politics to cryptography. Many of the *Amiga Shopper* writers have their own CIX accounts (mine is 'iwrigley'), so you can get first-hand advice on your problems.

For details on CIX, call 081 390 8446 (voice) or 081 390 1244 (modem).

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☐x **V48 TV & VIDEO GRAPHICS (8)** Packed with background screens for your video productions, Different types of graphic styles. **Peel,** takes an IFF Picture & peels it down the screen, & Much More.
☐x **V86 VIDEO PRODUCTION (2)** Both disks are Packed with video & Genlock utilities.
☐x **V109 PRINT STUDIO** Excellent for printing pictures or text. An excellent program for all printer owners.
☐x **V191 MASTER VIRUS KILLER** Virus Checker & Killer. With Excellent options. Includes search disk.
☐ **V193 THE EMULATORS** Covers Various **(2)** Formats which includes **CPM. IBM-PC & ST** Require 2 drives.
☐x **V194 M.R.BACKUP HD** An excellent Hard disk back up program. Backs up all or any part of the drive.
☐x **V195 GRAPHIC INTERCHANGE** Interchange graphics Between Atari St/PC Graphics to the Amiga.
☐x **V215 DISKMASTER v3.2** Copies files from one disk to another. **DISKSALV** Corrects & repairs.
☐ **V261 TEXTPLUS VERSION 3.0** This disk is not just an update but completly New Word processor.
☐x **V262 DUPLICATION & BACKUP:** Super Duper,Turbo copy, Sanity copy & PCopy. Four new copiers to backup your originals for save keeping.
☐x **V277 FORTRAN-77 v1.3c** Compiler, linker & run time support library. F470
☐x **V279 CROSSWORD CREATOR** A program that creates crosswords. UPDATED VERSION.
☐x **V284 MCAD PROGRAM** The Object Drawing Program for the Amiga.ie CAD
☐x **V285 EDUCATIONAL : TYPING TUTOR** A Simple typing which measures your speed on the keyboard.
☐x **V291 POSTSCRIPT INTERPRESTER v1.5** Down load any Post Script Fonts to your printer. Like a laser Printer.
☐x **V298 NORTH C v1.3 (2)** The most famous C: language on the Amiga, Encludes all files required.
☐x **V301 EYE OF THE BEHOLDER HINT BOOK** Inc Introduction, Background, Maps, Strategy & Solution.
☐x **V304 CHAOS STRIKES BACK HINT BOOK** Inc Introduction, Background, Maps, Strategy & Solution.
☐ **V306 A-GENE v3.125** Lastest version of the Family Tree program. Reviewed in CU Amiga.
☐x **V311 JACK NICKIUS COURSE DISKS (5)** A selection of Extra courses designed with the construction kit.
☐x **V323 ANALTICALC SPREAD SHEET (2)** This is the best spread sheet program to date on the Amiga.
☐ **V327 THE SOUND TRACKER CONVERTER** Load in a sound tracker tune & save an executable File.
☐ **V330 RED SECTOR EXTRAS DISK 1** On this disk are : 32 point Fonts, 16 Point fonts, vector stats, Star fields & music Space Journey Lorna. By The deadzone Troopers.
☐ **V331 RED SECTOR EXTRAS DISK 2** On this disk are Big logos,little Logos,Vector Stars, Starfields, Bob Anims, Vector Objects, Vector Ball Objects & various Fonts.
☐x **V332 AMIGA PUNT PROGRAM** Predict which horse will win with this horse prediction program.
☐x **V333 KING JAMES (4)** This version of the Bible By King james has been typing onto disk & Packed on (4)
☐ **V338 TRANSFORMER v3.3** This is the Latest version of the IBM Emulator disk. Require an MS-Dos disk.
☐x **V339 SPECTRUM EMULATOR DATA DISK 1**: Adventure Classics needs v216 or v443
☐ **V340 TSB VECTOR DESIGNER** The Special Bothers presnets The TSB Vector designer **v1.1,** This program will create filled vector objects, line vectors & Bobs.
☐x **V341 CLIP ART COLLECTION 2:** Eight more disks fully packed with excellent clip art. **(8)**
☐x **V349 SID v1.06** Replaces the CLI Command line & makes life very easy. Recommended for all
☐x **V350 BUSINESS CARD MAKER** Design your own Business cards on the Amiga.
☐x **V354 PDS UTILITIES No 13 : FREECOPY,** Removes protected games copy protection so that the user can install them on his/her hard disk. **DCAT,** Can create your own disk catalogue. **SCENERY,** Creates some excellent fractal based land scapes. **NUKE v1.4**
☐x **V358 GENESIS LANDSCAPE** Sculpt or Mould any fractal landscape in various types & sizes, Shareware.
☐x **V361 PDS UTILITIES 14 : MODCONVERT,** Program. **NOISE PLAYER,** Program. **MULTI PLAYER,** Program. which will play various modules not just one type.
☐ **V365 RED SECTOR MODULES (MUSIC) :** Various music modules for use with the RSI Demo Maker .
☐x **V366 600 BUSINESS LETTERS** There are over 600 Standard business letters on this disk. Can be used as they are, or insert some parts into your own letters/text.
☐x **V390 THE DESK TOP PUBLISHING PROGRAM** The first amiga PD Desk Top Publishing program. Includes various extra features over the old Word processor, Test Editor, Graphics editor & loads more.
☐x **V392 AMICASH BANKIN** The best bankin program that i have ever used on the Amiga. easy controls.
☐x **V393 PDS UTILITIES No 15 : BOOTGAMES,** The idea is to install one of two games onto your disks bootblock. **Brackout** & **Breaker,** Very simple to use. **BOOTGEN,** Another boot block program. **BOOTPIC,** This program will install any IFF picture onto your disks bootblock. **TRAINER MAKER.**
☐x **V394 CHEMESTETIC,** A program that draws molecules using the calotte model. Excellent effects.
☐ **V395 UEDIT WORD PROCESSOR v2.6h** This is an excellent Word Processor with various learn modes, Menu customization, Hypertext, On line help, A teach mode, Split windows, Copy, Paste, Undo & More.
☐x **V396 PDS UTILITIES No 16: DATAEASY,** Excellent Database program. A nice menu driven system. **LANDSCAPE,** Based around a landscape drawing
☐x **V397 MANDELBROT ADVENTURE KIT** A well done mandelbrot Generator with full source Code.
☐x **V399 PDS UTILITIES No 17 : STITCHERY,** A niting pattern program. **SMOVIE,** Video production scroller.
☐x **V400 RAY TRACER CONSTRUCTION KIT** A Ray tracer for the Amiga computer. Load Workbench first
☐x **V401 WINDOWBENCH v1.0 (2)** An excellent Work-bench II replacement for all v1.3 users. Recomended.
☐x **V403 AMOS UPDATE v1.32** This is the latest RAMOS update for the Amos Programmer.
☐x **V410 PDS UTILITIES No 1: PRINTING UTILITIES** PPType, PPShow, ABFD, View, Tiny Print, **FASTJET,** A program for Deskjet 500 users you want to use the resolution enhanced graphic set. **GWPrint II .**
☐x **V413 WORKBENCH 2 & WORK STATION** This is not just another workbench clone. It's a collection of utilities with the Workbench theme. **(2)**
☐x **V415 VIDEO SCREENS:1** Excellent back ground pictures for video production work. Nice back drops.
☐x **V417 SUPERBENCH & EXTRAS (2)** An excellent re-placement disk with more utilities than the original WB
☐ **V420 CURSOR BASIC COMPILER** Compile any Amiga Basic program with this utility disk.
☐x **V423 C: COMMANDS** This disk is filled with utilities which can be used in Startup-sequences
☐x **V424 PDS UTILITIES No 18** Utilities include, **Anti-flicker** program, Said to stop the flicker in High Res. **Atari ST Emulator**, Program to turn your amiga into an ST.
☐x **V431 IMPLODER v4.0** Reduces file size for sorage on hard drives our your own collection disks.
☐x **V433 ANIMATION STUDIO** An excellent Animation crestor for you to make your own.
☐x **V438 OPTI UTILITIES v2.0** This disk is packed with some excellent hard disk utilities.
☐x **V439 AMIGA C: MANUAL II** This manual is the complete C: manual for the Amiga & describes open & work with all parts of the C: system. It also contains various examples, some simple & some morecomplex all the way through the disks a tutorial is there to help you out. **(4)**
☐x **V443 SPECTRUM EMULATOR v1.2 By KGB** Main updated feature is it now has sound ability.
☐x **V444 PRINTER DRIVER UPDATE DISK III** Now contains instructionon how to install them. All previous drivers included on this disk. Over 90
☐x **V445 JRCOMM v1.02** This is the latest version of the excellent modem based computer program.
☐x **V455 LAND BUILDER** A fractal generating program to generate landscapes.
☐ **V463 SUPER C: COMMANDS** The disk is not as full as some others but comes with full instrustion.
☐x **V468 DIGITAL ADRESS BOOK** Collect & save your address lists on computer. Shareware.
☐x **V475 P.SUITE v1.4** A collection of programs called **P.Write**, a simple word processor, **P-Draw, P-Render** and much much more. Excellent disk
☐x **V479 CHESS & CHESS UTILITIES** A collection of chess related Puzzles, Programs & Utilities.
☐ **V483 THE RIPPERS GUIDE** A collection of help full utilities for people you rip pictures & sounds.
☐ **V484 ADVETURE SOLUTIONS (2)** Another good collection of adventure solutions for various games.
☐x **V489 AMIBASE PROFESSIONAL II** The latest updated version of the excellent Database progam. now includes various excellent new features.
☐x **V490 MESSY SID II** This is the latest version. It will read MS-Dos disks and tranfer any text files to & from the PC disk / Your Amiga. So you can do work on an IBM or an Amiga and swop text between them.
☐x **V492 JAM RIPPER v1.7 & JAM CRACKER v1.0** Also contains an excellent music ripper program.
☐x **V493 DESKBENCH (3)** This is an excellent Workbench replacment with special utilities.
☐x **V497 BEATRIX POTTER CLIP ART** An excellent collection of clip art for any DTP program or Dpaint.
☐ **V498 THIEF SOUND RIPPER v3.0** Finds Sidmon 1, 2 (Midi), JHam cracker, future Composer, Sound monitor, Noise/Protracker, Startrekker, Delta, sound system, david Whiaker & Noisepacker.
☐x **V499 STAR CHART v1.2** This is an excellent star plotting program with some intresting features.
☐x **V509 MED v3.2** This is another update to the Ultimate sound music Editor program.
☐x **V510 LITTLEBENCH** This workbench replacement is the first one for the new Amiga 500p Computer.
☐x **V515 THE A64 PACKAGE v2.0 (2)** A very complete C 64 Emulator Actually runs faster that 64. Runs 64 basic. Transfers disks from your original 64 disk drive with a shareware lead.
☐x **V517 VIDEO & AMIN : VIDEO_DB,** A program for keepin track on your video tape collections. **RTAP,** Lets you play large Anims on small Mem machines.
☐x **V518 IMAGE LAB** Performs many effects from simple averaging to fast fourier transforms. **Tools On Tap,** Does fades, colourbars & gray bar generation.
☐x **V519 STILLSTORE** Used to create over the shoulder graphic inserts like the 9'0 clock news.
☐x **V520 GRAPHICS : AGRAPH,** Creates colourfull pie, bar and line graphs. **PICBASE,** Shows reduced versions of all your IFF pictures. ** Requires V522
☐x **V521 PLOTTING & GRAPHICS: PLOTXY,** A powerful full featured plotting package. **PLANS,** A well done computer aided drafting program.
☐x **V522 ARP V1.3 : Conman v1.4,** Makes many im-provements to AmigaDos & makes your system easier to use. Includes full users developers guide.
☐x **V523 DICE C COMPILER (2)** Matthew Dillons full feat-ured powerfull C compiler & enviroment system.
☐x **V525 LABEL MAKER v1.3** An excellent disk printing program with various new features.
☐ **V526 DRAW MAP v3.1 (2)** Will now generate any 16 colour palette with user control, New features include larger maps with national boundaries, improved help and printing. 1.2Mb. (1Mb version on disk V263)
☐x **V528 PDS UTLS:20 : SUPERDUPER,** Another excellent disk copy program. Latest update with new feature. **Diskspeed & FullView.**
☐x **V529 FRACTAL & SCULPT 4d: Tree 4d,** Creates sculpt 4d trees with leaves. Contour 4d, IFSGen & Plasma.
☐x **V530 BUDGET** A program to help managing personal finances. This is a update to disk V280.
☐x **V536 CATALOGUE UTILITIES** A collection of utilities used to Catalogue disk/ Video/ Tape collections **(2)**
☐x **V543 DISK STATION (2)** An excellent workbench replacement with built in utilities like Sid and others
☐x **V546 KIDS PAINT** A painting program designed for children. Includes various colours and speech.
☐ **V547 RADBENCH v1.4** Another workbench replacment /Enhancement disk.
☐x **V549 ELECTROCAD v1.4** Another Updated on the cad drawning preview written in Amos.
☐**V550 KEFRENS POWER UTILITIES : NewTopaz, Power Fonts,** Create, Edit or change any 8x8 or 16x16 fonts. **Window,** Change size of dos windows.
☐x **V551 THE SUPER KILLERS V2.3: BOOT X v4.40,** This is the best virus killer disk to date kills over 232 virus & may be more, Includes excellent killers. Including **VC v6.0, Zero virus III v1.20 & VT v2.37.**
☐x **V552 PRINT UTILITIES** Disktik, HyperCat, Label print, Super retlab, LabelBase III.
☐ **V553 SHADOW UTILITIES** Raster Blaster II, Simplesinal & Text Writter **v1.0.**
☐ **V554 R.S.I. MUSIC MODULES 2/3** Another selection of music from Red Section. **(2)**
☐ **V556 RED SECTOR HELP DISK** Another disk to help you use the Red Sector Demo Creator.
☐x **V557 TOO SEXY UTILITIES** A very large selection of utilities Including, V-Checker, Print Studio, Super Dupper & Nuke. Far to many utilities to list.
☐ **V559 PUMA TRACKER v.99** Another good sound tracker close. Used to create the music from Toki.
☐ **V560 10 AMIGA PD COPIERS** A collection of copiers like amigaCopy, Coder copy, Pcopy, Rattlecopy & more.
☐x **V562 MORE UTILITIES PopDir, Exchange, QCal,** Excellent little calendar program. **PhoneDir.**
☐x **V567 PRINTER DRIVER GENERATORS** A selection of utilities with various excellent Printer Driver Generators.
☐x **V569 DUNGEON MASTER MAPPER** A littletool that creates maps of dungeons (and eventually towns) which can be used by a DM for use in a AD&D game.
☐x **V570 CHRIS HAMES UTILITIES : DIRWORK v1.51,** Excellent file copier simulal to diskmaster & Sid but contains more commands to hand. Recommend.
☐x **V571 WHOM II v2.02 (2)** An update to the Dr.Who database program. Gives all info on Dr.Who progs
☐x **V573 FILE & HARD DRIVE MANAGEMENT (2) : HDCLICK v2.0,** A program selector to make Hard disk Menus. Starts with gadgets.**FILE MINDER,** Utility for maintaining files & Directories. **DOSCONTROL,** Tool that combines the functionality of many separate tools.
☐x **V575 HOME BUSINESS PACK (6)** An excellent selection of utilities based on word processing, Data Management, Spread Sheets, Accounts & Printing.
☐x **V581 PDS PRINTING No 3 : PRINTER DRIVERS,** HP Deskjet 500 & 500 Colour, Canon BJ10e, BJ130, BJ300, Nec24p, Oki24p, 39p, Star24p, Panasonic9, Seikosha9. **HPMODE,** For use with Deskjet 500
☐x **V582 DB,** A Database with upto 50 fields,max of about 1.2 million records. **CLICKDOS II,** is an Amiga Dos enhacement utility. **FILEFIND & SUPERVIEW v3.0**
☐x **V583 ICONEDITOR III v2.0,** Can create Icons upto 640x200 pixels. **DOCTORICON v1.0,** Imports images as icons, Can Edit & Create any Amiga icons.
☐x **V584 EDUCATION : FASTFACTS,** Everything you ever needed to know about the solar system. **WORLD MAP,** Produces diffenent sorts of world maps. **PLANETS,** instant locations of plants. **MATH MOUNTAIN**
☐x **V585 ARCHIVERS** A selection od most archivers, like LHArc, Zoo, LHWarp, Pak, LZ, PKAZip, Zap, Zippy & more.
☐x **V586 FONTS & C: COMMANDS : DISKSALVE,** Repairs damaged disks. **SWEEP,** Free unUsed allocated memory.. **FONTASSIGN,** Assigns fonts to the SYS path.
☐x **V587 GELIGNITE FONTS (2)** A selection of Amiga fonts for use with any DTP Package or Dpaint disks.
☐ **V590 CRUNCH N COPY** A selection of programs that will crunch files & Copy disks for safe keeping.
☐ **V591 HAMLAB IFF CONVERTERS** GIF to IFF & back. Used with the GIF Machine to convert Pic to the IBM
☐x **V592 MICRO EMACS** This is an excellent Word processor also comes with a Spell checker program
☐x **V593 TEXT ENGINE v3.0** Another excellent word processor program Simple but will do the job
☐x **V598 DATABASE WIZ** This program will record all your Names & Address. Easy Database program.
☐x **V599 BBASE II v5.3** This disk is one of the most well known database program. Recommend.
☐ **V600 DELTA MUSIC EDITOR** An excellent Music editor program. A new flavor in music creation.
☐ **V601 AUDIO MAGIC v2.0** The latest collection of music based programs. Excellent selection.
☐ **V602 UNICOPY** New disk copy program with various extra features with onboard features.
☐x **V603 POOL FORCAST** An extra helping hand for people who monitor the pools.
☐ **V604 PD COPY v3.0** New disk copy with some extra commands & quick copy modes buit in.
☐x **V605 PRO CALC v1.0** An excellent production which will produces graphs. See AF32 for review
☐ **V606 SAMPLE MAKER v1.0** This program works in a similar way to synthesisers. just choose the wave form, alter it to taste & insert into your sample.
☐ **V607 PRO TRACKER v2.0** A music Editor, which you can create music with, Also load any sample.
☐ **V608 DCOPY v2.0** This is the best copier yet, powerfull commands with deep scan modes.
☐x **V610 GOLF SCORES v1.82** Golf scores just got better with easy charts to keep your averages upto date.
☐ **V611 FOOTBALL LEAGUE EDITOR** Update your leagues positions for instanfootball league Info.
☐x **V620 ASPICE v3.2** Circuit analysis program which has been modified to run on theAmiga.
☐x **V621 EDWORD v2.2** is a fully featured & opera-tional text / Word processor which offers all standard features & More like Powerful search routines, use any 8-point Amiga font & has a built in virus checker.
☐ **V624 NIB COPIER v2.0** The latest update to that excellent disk copy program. Requires 2 disk drives
☐ **V625 NCOMM v2.0,** It's here the long awaited update to the best moden related program on the Amiga. Also contains a New version of **LHArc.**
☐x **V627 DPAINT FONTS No's 1-3 (3)** The latest selection Fonts for use with any IFF DTP Program (3)
☐x **V630 AMICASH** Another excellent program to keep a track of all your checks & expences.
☐x **V634 DUNGEON MASTER II MAPS** IFF maps for FTL's Dungeon Master II. Load through Dpaint.
☐ **V635 IBeM EMULATOR** This is the best IBM Emulator which supports various colour monitors unlike all the others. Voted best shareware program.
☐x **V636 SHADES & FADES : TURBO TITLE,** Video titler especially suited for inserting film subtitles. **STAR BLANK,** Blanks screen & desplays a 3d Star Field.

THE STAR TREK SELECTION

☐x **AT05 KLINGON D7 CRUSER,** fires torpedoes while passing by. **NCC-1864 RELIANT,** Very good anim indeed.
☐x **AT10 ENTERPRICES,** Leaves the Star station dock. **NCC 1701-A,** The classic original Animation.
☐x **AT17 THE TWOK NCC-1860,** Reliant & the NCC 1701-A-Enterprise. **MENSCH ROBOTER.**
☐x **AT18 TWOK-0,** Anim **NCC 1860 Avenger** & **NCC 1701-A-Enterprise.** NCC 1089 Grissom.
☐x **AT22 APPROACHING VESSELS,** Animation, Binary Flight Wireframe landscape by T.Richter
☐x **AT23 STAR TREK FLEET MANEUVER,** NCC-1940 Fly over & by animation. excellent classic
☐x **AT33 THE PROBE II,** Animation. **BRID OF PREY,** Animation from Star Trek. **KLINGONHIT.**
☐x **AT34 LEAVING SPACE OFFICE,** Animation. **DOCKING,** Animation from star trek. **ATTACK MODE,** Bird of Prey Scout hip in attack mode.
☐x **1060 STAR TREK THE NEXT GENERATION,** This game is by Terry A. Mc Intosh. v1.47 *
☐x **1081 THE UTLTIMATE STAR TREK (2)** Game by Tobias Richter. Now with English instructions.
☐x **2222 STAR TREK THE NEXT GENERATION** This is the latest quiz game based on the Next generation **(2)**
☐x **SMAUG120** The **STAR TREK** Game by Eric Gustafson US Inport requires **1Mb** & **(3)** disks.
☐ **SMAUG156** The **STAR TREK** Game by Jimbo Barber The American version **1Mb** & **(2)** disks.
☐x **AMUSE19 TREK73,** A STAR TREK Battle Simulator where you can attack klingons & Romulans
☐x **V367 STAR TREK INFORMATION** A Database of all the original series. Very Detailed.
☐x **V616 THE FINAL FRONTIER ISSUE 1** This is a disk magazine based on Two disks both packed. **(2)**

MEGA DEMOS

He are the best NEW Mega demo's from our collect-ion from the past 2 months. The BESt are listed below
☐ **1988 RAY OF HOPE II BY MAGIX 12**
☐ **2028 IBB MANGAD MEGA DEMO**
☐ **2137 THE WILDFILE MEGA DEMO**
☐ **2250 ODYSSEY ALCATRAZ (5)** This 5 disk space Odyssey needs to been seen to be beleved. Brill
☐ **2259 HARDWIRED CRIONICS (2)**
☐ **2375 FEEL THE VIBEL BY DIGITAL**
☐ **2379 FLASH FOR FANTASY BY SANITY**
☐ **2391 RHYTHM NATION BY TLB (2)**
☐ **2400 DIGITAL DISCO II BY CHROME (2)**
☐ **2404 SKIN EGG ANIM BY EVA CORTESE (3)**
☐ **2413 DEVILS 'COLOURS' MEGA DEMO**

ERIC SCHWARTZ SECTION

☐x **1700 ANTI LEMMINS** Anim Requires **(2) 2Mb**
☐x **1703 THE DATING GAME** Anim requires **(2) 2Mb**
☐x **1842 SHUTTLE COCK** Animation **(1Mb)**
☐x **1850 LATE NIGHT** & **TERMINAL** Anim **(1Mb)**
☐x **2013 AGILLITY** Animation disk **(1Mb)**
☐x **2021 VIETNAM CONFLICT** Animation **(1Mb)**
☐x **2133 GULF WAR CONFLICT (2Mb)**
☐x **2307 AMY AT THE MOVIES II (4) 1Mb** Only.
☐x **2311 AMY vs THE WALKER II (2) 3Mb**
☐x **2384 AMY AT THE BEACH (2)** Probley the best animation by ES to date, Excellent **3Mb**
☐x **2427 CAMOURFLAGE ANIM 1Mb**
☐x **2428 MR POTATO HEAD'THE CIRCUS ACT (2)** By Chris Hill. know this is not an ES Anim but it upto his standard & features one of his charocters The Harrier. Excellent story.
☐x **2430 SKUNKS & HUNKS:POGO II** Animation **2Mb**
☐x **SMAUG302 AMYHIST** Introduces Amy the squirrel
☐x **SMAUG303 BATMAN,** Another Animation.**VTOL,** about a Harrier vs Propeller plane contest.
☐x **SMAUG305 HOW TO RUN,** How to run into a wall. Very funny Animation by Eric Schwartz.
☐x **SMAUG306 AMYWALKS,** Anim of Amy the squirrel Walking. **AMYJOGS,** Anim of Amy the Squirrel Walking

THE GAMES SELECTION

☐ **1073 TETRIS ORIGINAL**This is the closest game to the original tetris computer game. A Classic
☐x **1420 DTRIS** This is the best 2 Player Tetris game.
☐x **1454 MEGA BALL** An excellent Arkanoid game
☐x **1486 SOLITAIRE & SOLITAIRE ROYAL** Card games
☐x **1561 TRITWIS** This is the best version of Tetris on the Amiga. with 1 player, 2 player & 3 Payer options.
☐x **1735 ASTERIODS** 'THE ORIGINAL' Another old classic. This is the original classic computer game.
☐ **1747 LLAMATRON GAME 2001 By Jeff Minter** Briliant stuff & An excellent production. Shoot to kill
☐x **1749 SCRAMBLE** 'The Original'Remember that old classic well is now on the Amiga.The Shoot em up.
☐x **1870 PATIENCE'S,** This is the best version to date. **DOMINOS,** Play vs the computer or another player.
☐x **1977 POM POM GUNNER** Shoot down the incom-ing world wor II air planes in this Operation Wolf type game
☐x **1981 TRUCKING ON** A truck traveling adventure trading game. An excellent simulator. **(2)**
☐x **1984 AIR WARRIOR** The first real flight simulator on the Amiga with various Air planes to Fly
☐ **2018 JETMAN** Another Spectrum classic converted to the amiga. It's JetPak with all the original sounds.
☐x **2022 SEA LANCE** The first Silent Service type sub war game within our Amiga PD collection.
☐x **2054 ATIC ATAC** A rendition of the game from the original Spectrum computer. Graphic Maze adventure
☐x **2161 ETHOS GAME** An excellent new role playing/ Stratery game. Load through workbench.
☐x **2162 BATTLE OF BRITIAN WAR GAME** 2 Strategy war games which both need loading through Wb.
☐x **2164 DUNGEON ON NADROJ** This is the best Dungeons & Dragons Public domain type game we have played in a long time. . Recommended for all.
☐ **2171 WESTLANDS** An excellent game, viewed in most Magazine with very good reviews.
☐ **2173 CARD GAMES,** Various card games titled Cribbage, Blue Moon, King, Patience & Hearts.
☐x **2177 MISSION X : RAID II** This is a shoot em up game in the style of SWIV & 1943. Very good game
☐x **2178 SURVIVOR** A space based adveture game within the Aliens theme. Nice colourfull graphics
☐x **2179 ADVENTURES IN HELL** A collection of six games, Jedi, Star trek, Atlantis, Ring & Indication.
☐x **2180 SKODA CHALLENGE** An excellect 4 player hotRod game written in Amos. Simple but good fun.
☐x **2185 BATTLECARS** Excellent Solid 3d Graphics. travel around, track down the other cars & destroy.
☐x **2199 PARACHUTE JOUST** You are falling down to earth. & must take the Parachute from the other player.
☐x **2219 NAPOLENIC WAR SIMULATOR v5.0** An excellent simulator program, Sent direct by the Author.
☐x **2220 STRATEGIC GAMES,** Eternal Rome, Lords of Hosts, In Moonshine. An Excellent collection.of games.
☐x **2221 MIND GAMES 21** of the best Mind games to challenge your mind not your shooting skills.
☐ **2224 SWORD OF THE WARLOCK** A Bards tales / Eye of the Beholder adventure game packed on three disks. The best Shareware role playing game on the amiga. Excellent Adveture. **(3) 1Mb (2Drives)**
☐x **2265 HOLLYWOOD QUIZ,** A nicely produced quiz game with a choice of subjects. **DOWNHILL SKIING**
☐x **2272 BLACK JACK LAB** Play Pontoon upto 7 Players. The computer plays banker & knows the popular versions of the game.
☐x **2278 CARD SHARP** A very professionally presented selection of solitaire type card games. Excellent versions
☐x **2279 SUB ATTACK v1.0** Control the torpedoes & sink the enemy ships as they sail past. **LANDMINE.**
☐x **2280 DIPLOMANCY v2.0** A classic strategy game loosely based on World War 1. A very detailed game.
☐x **2313 REVENGE OF THE MUTANT CAMELS** By Jeff Minter The ride of a life time with mutant camels that spit plutonium death. Now PLUS Compatible.
☐x **2357 SPACE POKER** The alternative Poker Game
☐x **2411 TOTAL WAR** The board game version of RISK
☐x **2412 FORMULA 1 SIMULATOR** Anaditive simulator
☐x **2416 MIDNIGHT THIEF** Excellent adventure Game
☐x **APD329 AMOS FRUIT MACHINE II** As near as possable to the fruit machine found in Pubs & Arcades.
☐x **SMAUG312 AMI MORIA v5.22** This is the latest update to the Original Moria adventure game. Better graphics, and the larest adventure to date. Excellent

LATEST AMOS & FISH DISKS

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continued from page 150

tests. It doesn't have much in the way of added features; the author has obviously gone all out for speed and efficiency, and left it at that. In fact, this is a perfectly reasonable approach; when looking at some of the other programs, I must admit that I found myself wondering just who would want all the esoteric options that they provide.

POWERPACKER

PowerPacker is now a commercial program, but version 2.3b remains as shareware – to register send $10 to the author, Nico Francois, in Belgium.

PowerPacker is the program responsible for the flashing cursor arrow which you sometimes see when you run a program or read a doc file. It produces a self-decompressing version of any program which you run it on, while crunched data files such as documentation can be read using something like *PPmore* – a text reader which can decompress *PowerPacker* files.

PowerPacker is Intuition-based, and has a large range of menu options – studying the manual is certainly recommended before you start trying to use the program. It's certainly not the fastest file compression program available, but features such as a built-in scripting language go some way to reducing the problem – just write a quick script to tell the program what to do, then let it get on with the job while you go off to the pub for a couple of hours.

Double-clicking on a program which has been compressed with *PowerPacker* makes the cursor (or the background – you decide when you compress the program) flash in different colours while the program decrunches, then it runs as normal. For this reason – you don't need to manually decompress files – *PowerPacker* has become extremely successful in the Amiga world. It's up to you whether you are willing to wait while programs are compressed – *PowerPacker* is by far the slowest program under test.

AMIGARC

For completeness, I've also tested the Amiga version of Arc, which was written by Raymond S Brand (the original Arc was created by System Enhancement Associates). Raymond requests a fee if you use the program, although he doesn't specify an amount for home users; commercial users must pay $35. Arc isn't a widely-used compression format on the Amiga, but you may still find some archives which have been created with this program.

IS THERE ANYBODY OUT THERE?

Well, not much of a response to my request for disk magazines so far; come on, guys, I can't review them if I don't see them!

ARCHIVERS

PD Soft disk V585

All of the above compression programs are available on various Fish disks or from on-line services such as CIX. However, just prior to starting work on this column, I received a disk called *Archivers* from PD Soft. Although the programs included are not all the most recent versions available, this disk contains loads of programs: *Lharc*, *Zoo*, *LX*, *Arc* and *PKAZip* to name but a few.

There is also a program called *ArchEdge*, which puts an Intuition-based front-end on many of the programs; and this is what really interested me. Archiving programs can be a real pain to use, because you've got to remember the exact path to the files that you want to compress, and the exact path of your destination archive file.

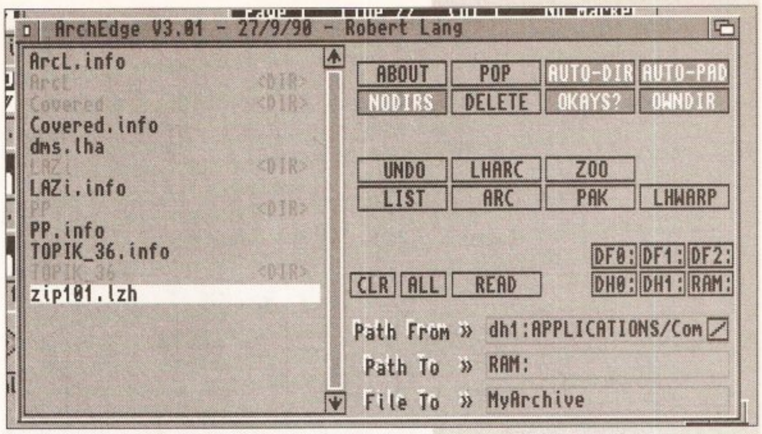
> **"ArchEdge puts an Intuition-based front end on many of the archivers."**

ArchEdge does away with this by providing you with a (somewhat quirky) user interface which allows you to specify files via a standard Requester. You select the files that you want, where the finished output is to be stored and whether you are compressing or de-compressing.

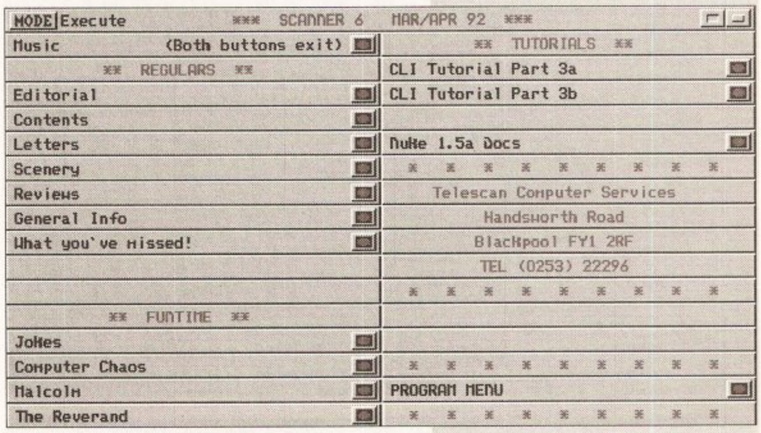
If you are de-compressing, the program works out which utility has been used and automatically selects the right one. You still need the relevant utilities in your C: directory, but they are all included on the disk.

ArchEdge will support *Zip*, *Lharc*, *Arc*, *Zoo*, *Pak* (which is a virtually unused compressor) and *LHWarp*, a disk compression program. It proved to be a little unstable on my Amiga (an A500 Plus which is equipped with some extra memory and a hard disk drive), sometimes crashing without warning, but I can live with that, given that it finally allows me to use things like *Lharc* without having to work out the command syntax beforehand.

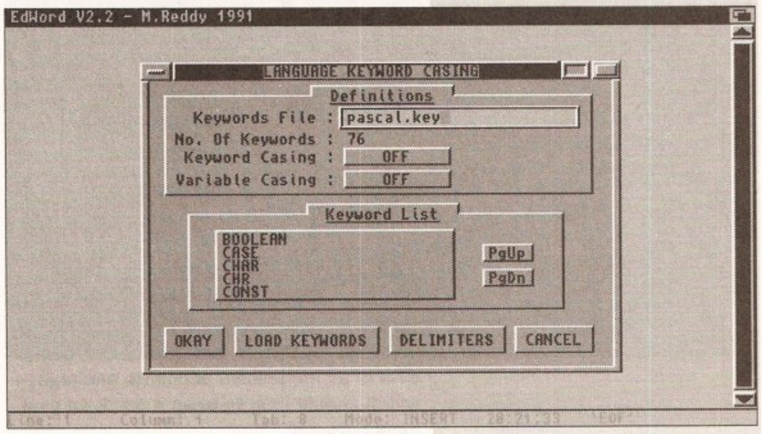
This disk is well worth getting hold of; the collection of utilities plus *ArchEdge* is well worth the money.



***ArchEdge* automatically works out what type of archive you want to decompress – as long as it's supported by the program, of course!**



***Scanner*, the disk magazine from Telescan Computer Services, is accessed using a clear and attractive menuing system**



***EdWord* is just about the last word in text editors – whatever the feature you want, it's bound to be there**

DISK MAGAZINES

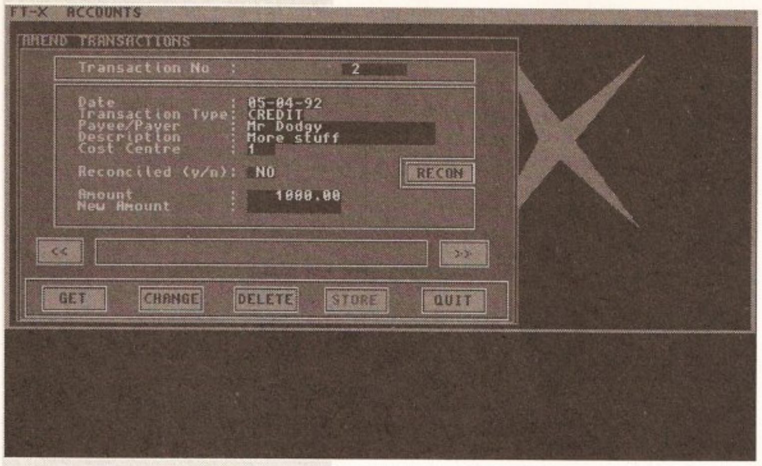
SCANNER Issue 6

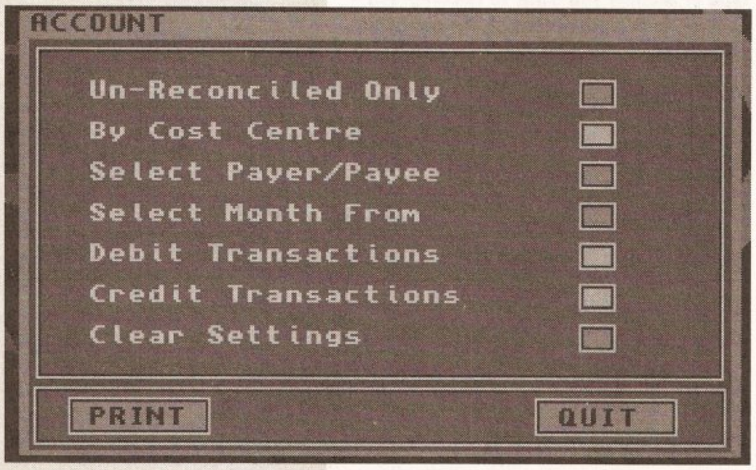
Telescan Computer Services

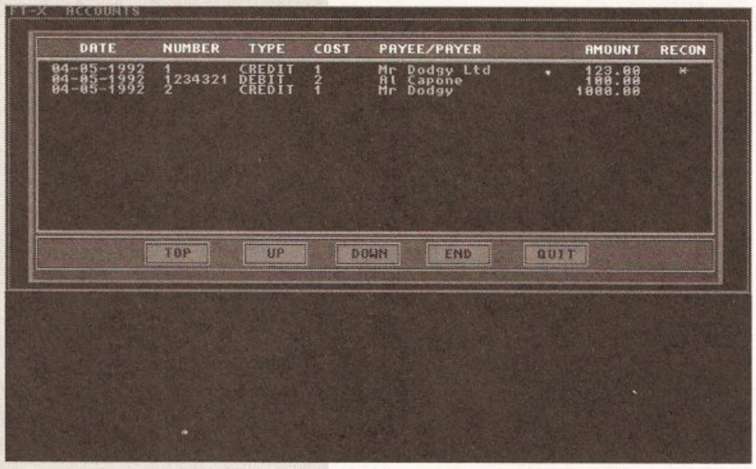
One disk mag which regularly turns up is *Scanner*, from Telescan Computer Services, which is run by Norman Jordan. It's a bi-monthly, two-disk affair which costs £2.50. And well worth the subscription price it is, too.

Scanner self-boots and, after checking your Amiga for viruses with the Nuke program, presents a nice, clean menu screen. Most of the stuff accessible from the first menu is text: editorial, general information, jokes, a CLI tutorial and so on. However, clicking on the 'Program menu' button presents a second screen which allows you access to a surprisingly large number of programs. These range through games and demos to more serious applications; on disk 6, for example, there are drivers for the Canon BJ series of printers, *Virus Checker 6.01* (as well as *Nuke*), the latest version of the *bBase II* database program, and a great deal more.

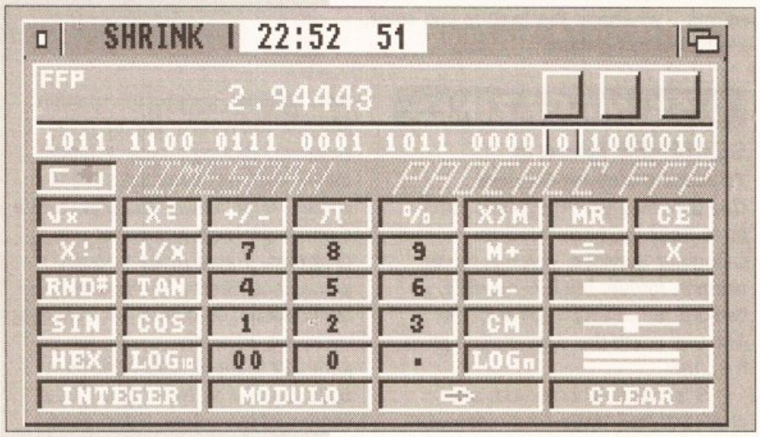
Although some of the jokes on the disk are a little suspect (well,







FT-X **is an impressive accounts package, which should help to keep a track on your bank balance**



ProCalc **is a programmer's calculator which manages to fit a lot (perhaps too much) into a small window**

they are if you're politically correct, anyway) and some of the grammar is, to be kind, 'creative', this disk magazine really is worth getting hold of. For a copy of issue 6, send a cheque for £2.50, made out to N Jordan, to Telescan Computer Services, Handsworth Road, Blackpool FY1 2RF.

And incidentally, while I'm on the subject of disk magazines, I must apologise for an error in the review of *Premier*, in the April issue. The first issue is freely distributable, but is not actually free. The author is making a charge of £1.50 to cover disks, postage and so on. Sorry!

Value for money 9/10

UTILITIES

ANTS UTILITY DISK 2

Aardvark PD

Aardvark PD is a small PD library, and the owners say that they try to stock "only good quality titles with a rating of 7/10 or over" – a very worthy intention. Aardvark can be contacted on 0509 210157.

Ants (sic) *Utility Disk 2* is compiled by Anthony Coop from Blackpool (why does everyone seem to come from Blackpool...?), and contains a range of utilities such as *TextPlus 3.0EN* (reviewed in the last issue of *Amiga Shopper*), *LVD* (a link virus killer) and *MED*. None of the programs are original, but it's a reasonable collection of utilities. For that reason, I'll give it...

Value for money 7/10

EDWORD 2.2

PD Soft disk V621

Edword is a text editor for programmers – and a damned good one it is, too. It was written by Martin Reddy, who asks just £5 as a shareware fee – which means that there's no excuse not to send it to him.

The program is a rather large 143K in size, and is packed full of features. For instance (and in no particular order), you can convert numbers between binary, octal, decimal and hexadecimal. You can force keywords to upper case (there are three keyword files supplied, for Pascal, C and AmigaDOS). You can access AmigaDOS directly from within the program. You can alter a file's attributes. You can set a filter on the 'Open file' Requester so that only, say, files ending in '.GFA' are displayed. You can set the program to auto-indent as you enter your program. You can... the list goes on.

This really is one of the most fully-featured text editors that I've seen. I congratulate Martin – and I'd advise any programmers out there to get hold of a copy.

Value for money 9/10

RATING THE PROGRAMS

I use two different ratings systems (just to be awkward). If I'm reviewing a single program, I give a 'Program Rating' at the end. If on the other hand, I'm looking at a disk full of utilities or whatever, you'll find a 'Value for money' rating at the end.

FT-X ACCOUNTS

Downloaded from CIX

FT-X Accounts (snappy name!) is a shareware program from a guy called Fred Trigg, who asks that you send £20 if you use the program. For that, you will get an updated version of the program which has some extra features added. Not that the unregistered version is limited – it's quite a powerful program, with good documentation too.

You'll have guessed from the name that this is an accounting program, but it's not the normal 'home accounting'-type jobby: *FT-X* could actually be used to keep track of a business' finances.

Getting started isn't too easy; I had a couple of crashes before I got the hang of everything, and I must say that some of the methods used to enter data aren't the most intuitive that I've seen. However, a few minutes' playing solved things, and once I got further into the program I realised just how impressive it is.

"FT-X Accounts – at last, a way of checking up on your bank!"

You start by entering your details – name, address and so on. You also enter the starting number for credit and debit payments; typically you'd start with 1 for credits, and with the first cheque number for debits.

The next thing to do is set up some cost centres. These are descriptions of where money comes from and where it goes to. If you were using the program for your home accounts, you'd set up cost centres for things like Food, Electricity, Salary, Clothing and so on. A business would have things like Till Receipts, Mail Order, Goods Purchased or whatever.

To enter a transaction, you supply a cost centre, details like the

continued on page 156

continued from page 154

date and payer/payee, and the amount involved. Strangely, you enter figures with no regard to the decimal point – so you'd enter £100 as '10000', and £1.23 as '123'. This may be the way accountants are used to doing things, but it caught me out a few times. You must also state whether the payment has been reconciled or not. Reconciliation is the process of checking your accounts with your bank statement – so you only enter a payment/debit as reconciled if you have a statement which agrees with it. At last – a way of checking up on your bank!

When you want to print out a balance, you are provided with a reasonably wide range of options, including the ability to print only unreconciled entries, whether to print debits, credits or both, and whether to sort by cost centre. Registered owners will get a version of the program which also allows them to print out the accounts from a certain month.

Transactions can be altered after they have been entered – to flag them as reconciled, for example – and the new reconciled balance calculated. Finally, at the end of your accounting period you can instruct the program to print out all the transactions and then erase the individual details from disk, leaving only the balance, next reference number and so on.

FT-X is an impressive program: I've not even seen a commercial accounting program with this range of features on the Amiga. Fred Trigg is to be congratulated; if you can live with the occasional quirk in user interface design, I'd recommend *FT-X* to anyone who thinks that their accounts could be improved by computerisation.

Program rating....................8/10

"The only complaint with ProCalc is that there is just too much data on display."

PROCALC

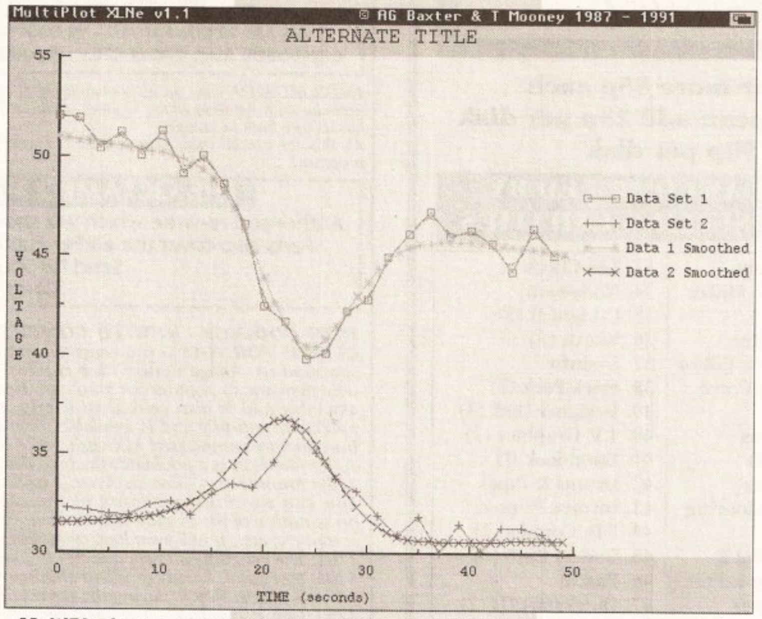
PD Soft disk V605

ProCalc, by Timespan Software, is intended for any programmers out there. It has two modes: 68000 and FFP (floating point). Cycling between the two is done by means of the [TAB] key, and each mode has different functions; for instance, the 68000 mode allows you to perform operations like EOR and NOT on data, while the FFP mode gives you things like a random number generator and the ability to calculate square roots and factorials.

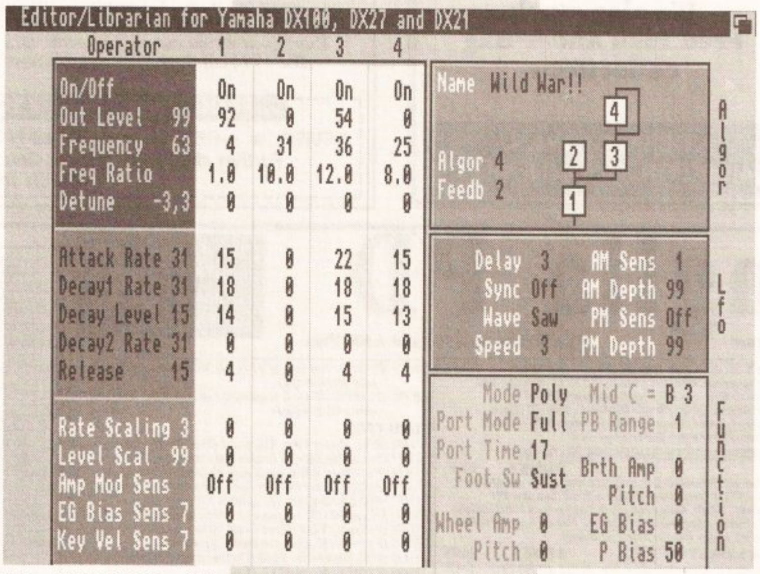
Data input is done either via the keyboard or by clicking on the number keys displayed on the screen. The calculator launches in 'shrunk' mode, where it appears as a small gadget at the top of the screen, displaying the time (yes, you get a clock display for free). Clicking on 'Expand' brings it to full size.

My only real complaint with *ProCalc* is that there is just too much data on display: binary digits zing about with alarming speed, and it would have been nice to have just a little more explanation in the doc file of just what everything is. For some reason, the programmer has decided to keep the calculator's window as small as possible; it wouldn't have hurt to make it half an inch deeper, and increase the size of some of the buttons.

Program rating....................5/10



MultiPlot **is one of the most powerful data plotting packages available. The ability to produce 'best fit' curves will please scientists and maths students**



The ***DX100 Editor/Librarian*** **provides a reasonable, although not spectacular, way of keeping your libraries of sounds in order. Editing sounds can be a little frustrating, though**

MULTIPLOT

Fish disk 572

Supplied by Unique Computing

MultiPlot is a shareware data plotting program; the authors, Alan Baxter and Tim Mooney, request a $20 fee. And if you have any need to display data on-screen or on a printer in the form of a graph, it's $20 extremely well spent.

The program starts in overscan mode by default, although this can be changed by altering one of the tool types. It reads data from a plain ASCII file, which should contain columns of numbers as generated by a spreadsheet, database or whatever. You can, of course, just use a word processor or text editor to enter the numbers.

The Requesters used for loading data don't conform very well to the user interface standards that we expect to see these days, but they are easy enough to cope with once you've got used to them. After data has been loaded, the format of the display can be customised to contain things such as a background grid and so on. You can then print out to any device which uses the PLT: port, such as a plotter or laser printer.

But the really impressive feature of *MultiPlot* is its ability to provide 'best fit' curves for data entered. These can be linear, interpolated, polynomial... you name it. And once you've produced the graph to your liking, you can save it out not only as an IFF but also as encapsulated PostScript (EPSF), PostScript, Draw (a Mac format) or in HPGL/2 format. This means that you should be able to port the image to whatever device you want.

The programmers have obviously spent some time using Macs: things like the Edit menu have clearly been designed with the Macintosh user interface in mind. This means that the commands are clearly laid out, and are very easy to learn.

True, *MultiPlot* will not appeal to everyone. But if you ever have the need to produce good-looking, professional graphs – be it for work or at school – this program should solve all your problems.

Program rating 8/10

DX100 AND TX81Z EDITORS

Fish disk 598

Supplied by Unique Computing

Fish disk 598 contains a voice editor and librarian for Yamaha's DX100 synthesiser – it is also compatible with the DX27 and DX21. The program by James M Smith is shareware – $30, to be precise.

To use the program, you (obviously) need one of the three synths mentioned, plus a MIDI adaptor which plugs into the Amiga's serial port. Connect up the DX, select the correct MIDI channel – one of four possibles – and you're ready.

The program allows you to edit and audition voices before the whole voice bank is transferred over to the instrument – you can play sounds

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D280 - Amy V.S. Walker Anim (1 Meg)
D294 - Life Of Brian (P) (2 disks)
D297 - Anti Lemmin Demo (2 Meg) (2 disks)
D298 - Robocop Animation (1 Meg) (P)
D300 - Silents: Ice Demo
D254 - Virtual World (1 Meg)
D150 - Windsurfer Animation (P)
D315 - Mr Potato Head (1 Meg) (P)
D316 - Creature Comforts Demo
D318 - 3D Pinball Animation (1 Meg) (P)
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D002 - Walker 2 (1 Meg)
D003 - Walker 3 (1 Meg)
D004 - Cool Cougar (1 Meg)
D012 - Rebels Megademo
D014 - Space Ace Demo
D023 - Stealthy 2 Anim (1 Meg)
D028 - Budbrain Mega Demo (2 disks)
D047 - RAF Megademo (2 disks)
D045 - Arse Wipe Advert
D059 - Red Sector Megademo (2 disks)
D062 - Red Sector Cebit 90
D077 - Good Morning Vietnam
D088 - Silents Megademo
D095 - Outsiders Acid Demo
D115 - Vision Mega Demo 4
D127 - Chubby Brown
D134 - Garfield Demo
D147 - Neighbours Slideshow
D148 - Viz Slideshow
D151 - Robocop 2 Slideshow
D153 - Epic Game Demo (1 Meg)
D158 - Operation Vark
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D163 - Probe Sequence
D164 - Slycath Amazing Demo Comp
D168 - Horizon Mega Demo
D169 - Budbrain Mega Demo 2
D176 - Jasper Carrot Demo
D184 - Dragons Lair 2 Demo
D185 Wrath Of The Demon Demo
D187 - Batman The Movie Demo
D251 - Decaying Paradise (1 Meg)
D264 - Hardwired (1 Meg)
D225 - Phenomena Enigma (1 Meg)
D231 - KGB Mega Demo (2 disks - 1Meg)
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D325 - Hynautic Hammer
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D330 - Greatest Demos Vol 2
D333 - Greatest Demos Vol 3
D345 - It Came From The Desert Demo
D346 - Harry Meets A ST Owner
D347 - Shuttle Cock Animation
D354 - NASA Slideshow
D357 - KGB Mega Demo 2
D359 - Kefrens Guardian Dragon
D370 - Terminator 2 Slide Show
D379 - Navy Seals SlideShow
D388 - Track Ro Vectra

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M012 - DMOB Music 4 (2 disks)
M014 - Rebel Megablast
M016 - Micromix 2
M022 - Amiga Charts Mix 3
M029 - D-Mob Music 3
M023 - Titan Trax 1
M026 - Amiga Charts Mix 5
M029 - D-MOB Music 3
M034 - Arnie Swarzenaggar Total Remix (2 disks)
M035 - Digital Concert 2
M036 - Digital Concert 3
M037 - Digital Concert 4
M038 - Digital Concert 5
M039 - Digital Concert 6
M040 - RAF Megamix 1
M042 - Bat Dance Remix
M049 - Ben Elton (xxx)
M057 - DMOB Music 1
M081 - Flash 2 (disks)
M102 - Debbie Gibson's Electric Youth (2 disks)
M114 - Betty Boo - Doing The Do
M121 - Band Aid 11 (2 disks)
M122 - RAF Beat Thiz 1
M123 - RAF Beat Thiz 2
M124 - RAF Beat Thiz 3
M125 - RAF Megamix 2 (2 disks)
M126 - Amiga Charts Mix 2
M127 - Amiga Charts Mix 6
M134 - Miami Vice Theme (4 disks)
M136 - Laurel And Hardy (2 disks)
M141 - JM Jarre - Definitive
M143 - CD Player Demo (1 Meg)
M144 - Flash! Queen (2)
M159 - Techotronic Remix
M161 - Crusaders Bacteria
M183 - ScooPex Beast Sonix
M157 - Digital Concert 5 (V1)
M151 - Crusaders: Genesis
M132 - Depeche Mode Mix Disk
M156 - Seal Crazy Remix (1 Meg)
M185 - I Think We're Alone
M186 - Everybody Dance Now
M187 - Doing The Do (Remix)
M189 - Amazing Tunes (1 Meg) (3 disks)
M190 - Move Any Mountain
M192 - Charly Remix
M193 - What Can You Do For Me?
M194 - Bruno Music Box (2 disks)
M195 - Manic Raves (2 disks)
M199 - Star Trek Theme
M201 - Journey Into Sound
M203 - Looney Tunes
M205 - Vogue CD Player
M206 - Flashing Bytes
M208 - Remember The Time (Remix)
M209 - Enjoy Live
M211 - Rave Around The Clock
M212 - Raver's Delight
M216 - Genesis
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M249 - Move Any Mountain
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M253 - Crazy Looney Tunes
M260 - Old Soul Remix
M265 - Stand By Me
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U071 - D-Copy
U073 - Hard Disk Utilities
U074 - Easy Back Up And View 80
U075 - Pascal C Compiler
U078 - A500 + Utilities (For The A500 +only)
U080 - Turbotitle
U081 - S-Movie
U082 - Graphs
U083 - Drawmap V3.1
U085 - RBase II V5
U086 - Text Engine V3
U025 - Sid V1 6
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U140 - Language Tutor
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U157 - Antivirus V3.14
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U178 - Faulty Towers Samples
U179 - News Flash 21
U183 - Swag No 4: Fractals
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★ GAMES ★

U186 - Draw Map V3.1
G001 - Star Trek 3 (2 disks)
G006 - Breakout Construction Kit
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G014 - Buck Rogers
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VISA

continued from page 156

either from the synth's keyboard or the Amiga's. However, it's the editing of the voices that I'm not keen on. With the editor display on-screen, you click on parameters to change them. But clicking on a number immediately deletes it, and leaves the cursor over a blank space. You then type in the new value. If you forget what was originally there, though, you're stuck; just hitting the Return key will fill the space with a value of zero. The only way to return the parameter to its original setting is to cancel the editing procedure altogether – which means discarding any other changes that you've made.

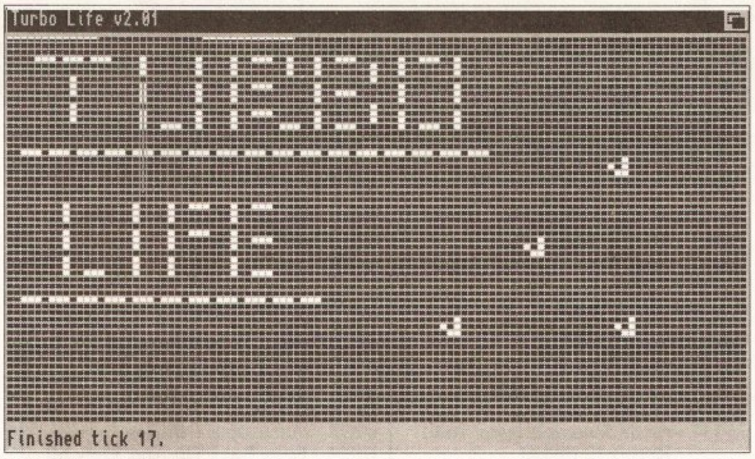
Some people may not see this as a major failing, but those who, like me, tend to play around and then forget what the original value was will find this incredibly frustrating.

Another failing is the fact that the program isn't very multitasking-friendly. Although it's possible to hide the screen and go back to the Workbench or another running program, for some reason windows deselect themselves about two seconds after you've clicked on them – so they are totally unusable. No data is lost, and the program didn't crash, but you have to quit from the librarian before you can use any other applications. So much for multitasking!

Still, those gripes aside, this is a perfectly reasonable librarian and editor program.

Also on the same Fish disk is a similar editor for the TX81Z and DX11 synths.

Program rating....................7/10



***TurboLife* – probably one of the most mediocre adaptations of *Life* to be seen on a computer for some time...**

TURBOLIFE

Fish disk 584
Supplied by Unique Computing

Wizard Works wants $10 as a shareware fee for this version of the classic *Life* simulation – but quite how they can get away with asking for any money at all I don't know.

Life has been ported to every computer ever built, and the Amiga is no exception. There are some very passable versions available, with additions to the basic model such as colour and even sound.

All of this makes *TurboLife* seem just a little basic. True, it is a passable version – the grid is large, so there will be no problem running out of space while you are creating your colony. But that's about it – no special features, not even a click as each iteration is produced. It's now generally accepted that *Life* is fairly 'old hat', and that only really whizzy versions are now worth exploring. *TurboLife* just ain't in with a chance.

Program rating....................4/10

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Essex SS16 4JA
☎ 0268 553963

George Thompson Services
Cucumber Hall Farm,
Cucumber Lane
Essendon
Herts AL9 6JB
☎ 0707 664 654

Goldstar Computers
PO Box 2
Tyldesley
Manchester M29 7BN
☎ 0942 895320

ICPUG
PO BOX 1309
London N3 2UT
☎ 081-346 0050

Kernow Software PD Library
51 Ennors Road
Newquay, Cornwall

NBS
1 Chain Lane, Newport
Isle Of Wight PO30 5QA
☎ 0983 529594

Neural Images
4 Flint Walk, Hartlepool
Cleveland TS26 0TE
☎ 0492 263508

Office Choice (OC-PD)
30 Town St, Kirkintilloch
Glasgow G66 1NL
☎ 0236 737901

PD Soft
1 Bryant Ave, Southend-On-Sea
Essex SS1 2YD
☎ 0702 612259

Pentire PD
10a Hag Hill Lane, Taplow
Maidenhead, Berks SL6 0JH
☎ 0628 666641

Public Dominator
PO BOX 801, Bishop's Stortford
Herts CM23 3TZ
☎ 0279 757692

Riverdene PDL
30a School Road
Tilehurst, Reading
Berkshire RG3 5AN
☎ 0734 452416

Telescan Computer Services
Handsworth Road
Blackpool FY5 1SB
☎ 0253 22296

Sector 16
160 Hollow Way, Cowley, Oxford
☎ 0865 774472

Seventeen Bit Software
PO BOX 97, Wakefield
West Yorks WF1 1XX
☎ 0924 366982

Software Expressions
Hebron House, Sion Road
Bedminster
Bristol BS3 3BD
☎ 0272 637634

Softville
Unit 5, Stratfield Park
Elettra Avenue,
Waterlooville
Hants
PO7 7XN
☎ 0705 266509

Start Computer Systems
Barbican House
Bonnersfield
Sunderland, SR6 0AA
☎ 091 564 1400

Startronics
4 Arnold Drive, Droylsden
Manchester M35 6RE
☎ 061 370 9115

Unique Computing
114 Salters Road, Gosforth
Newcastle on Tyne, NE3 3UP
☎ 091-284 7976

Vally PD
PO BOX 15, Peterlee
Co Durham SR8 1NZ
☎ 091-587 1195

Wirral PD
PO Box 4, Birkenhead
Merseyside L43 4FW
☎ 051 651 0646

BUYING ADVICE FOR SHOPPERS

Whether buying over the phone or at a local store, here's our advice on how to get what you want

BUYING IN PERSON

- Where possible, always test any software and hardware in the shop before taking it home, to make sure that it works properly.
- Make sure you have all the necessary leads, manuals or other accessories you need.
- Don't forget to keep your receipt.

BUYING BY PHONE

- Be as clear as possible when stating what you want to buy. Make sure you confirm all the technical details of what you are buying. Some things to bear in mind are version numbers, memory requirements, other required hardware or software and compatibility with your particular model of Amiga (that is, make sure you know which version of Kickstart you have).
- Check the price you are asked to pay, and make sure that it's the same as the price advertised.
- Check that what you are ordering is actually in stock.
- Check when and how the article will be delivered, and that any extra charges are as stated on the advert.
- Make a note of the date and time when you order the product.

BUYING BY POST

As with buying by phone, you should clearly state exactly what it is you are buying, at what price (refer to the magazine, page and issue number where it's advertised) and give any relevant information about your system set-up where necessary. You should also make sure you keep copies of all correspondence both to and from the company concerned.

MAKING RETURNS

Whichever method you buy by, you are entitled to return a product if it fails to meet any one of the following three criteria:

- The goods must be of 'merchantable quality'.
- The goods must be 'as described'.
- The goods must be fit for the purpose for which they were sold.

If they fail to satisfy any or all of the criteria, then you are then entitled to:

- Return them for a refund.
- Receive compensation for part of the value.
- Get a replacement or free repair.

When returning anything, ensure that you have proof of purchase and that you return the item as soon as possible after receiving it. For this reason it is important that you check the hardware or software as soon as it is delivered to make sure everything you ordered is there and works as it is supposed to.

HOW TO PAY

Paying by credit card is the most sensible way, whether buying in person, by post or on the phone, because you may be able to claim the money from the credit card company even if the firm you ordered from has gone bust or refuses to help sort out your problem.

Otherwise, you should pay by crossed cheque or postal order – never send coins or notes through the mail.

GETTING REPAIRS

Always check the conditions of the guarantee, and servicing and replacement policy, so that you know what level of support to expect. Always fill in and return warranty cards as soon as possible, and make sure that you are aware of all the conditions contained in the guarantee.

BUYING PD

Even though PD software is relatively inexpensive, you should still apply the guidelines set out above, making sure that you confirm all orders as clearly as possible.

Shopping around is still important when buying PD because different houses charge different prices for the same disks. There is no set pricing structure for disks, but bear in mind that PD houses are, in theory, supposed to be non-profit making operations. AS

A CHECK LIST FOR MAIL ORDER BUYING

1 **Make sure you know exactly what you want. Draw up a checklist of the specifications you are looking for and what you want it to be able to do. Check with the suppliers that their product matches your list**

2 **Will the product you have in mind work with your existing set-up, and anything else you are planning to buy?**

3 **Can you see a demonstration? Many products are on display at computer shows around the country.**

4 **Are there any hidden extras? Does it need 1Mb to run, or a hard disk?**

5 **What technical support is provided by the supplier? Does the manufacturer offer after-sales advice? Check before you buy.**

6 **Check the guarantee terms. How long is the free warranty? What does it offer?**

7 **Draw up a list of these details and make them a condition of your order.**

8 **Check the price and delivery details when you order, and make a note of them.**

9 **Note down when you placed the order and who you spoke to.**

10 **When it arrives, check everything carefully. If anything is missing, don't use the product at all – contact the supplier. If it doesn't work, make the obvious checks such as the fuse. If it still doesn't work don't try to fix it – contact the supplier.**

ADVERTISERS INDEX

PRODUCT LOCATOR

PRODUCT LOCATOR

SOFTWARE • SOFTWARE • SOFTWARE • SOFTWARE • SOFTWARE • SOFTWARE • SOFTWARE • SOFTWARE

Welcome to the *Amiga Shopper* Buyer's Guide, your regular guide to what's hot and what's not in the Amiga market place. It's designed as a simple-to-use yet comprehensive guide which will help you to make the right buying decisions. It may not include each and every product ever produced for the Amiga (that would take up virtually the whole of *Amiga Shopper*!), but rest assured that all the major brands are here.

The Buyer's Guide will run each and every month and as new products are released and others discontinued, we'll be updating it accordingly. This month we bring you what is possibly the most comprehensive guide to software for the Amiga owner.

PAINT PROGRAMS

Product	Supplier	Price	Screen Modes	Max Colours	Overscan	Animation	Rating	Issue
MyPaint	HB Marketing	£20	L	12	No	No	***	2
The Graphics Studio	Accolade	£50	L/M	32	No	No	***	2
Deluxe Paint 3	Electronic Arts	£70	L/LI/M/H	64	Yes	Yes	*****	2
Deluxe Paint 4	Electronic Arts	£90	L/LI/M/H	4096	Yes	Yes	*****	10
Deluxe PhotoLab	Electronic Arts	£130	L/LI/M/H	4096	Yes	No	***	2
DigiPaint 3	Silica Systems	£80	L/LI	4096	Yes	No	****	2
Photon Paint 2	MicroIllusions	£90	L/LI	4096	Yes	Yes	*****	2
SpectraColour	HB Marketing	£60	L/LI	4096	Yes	Yes	***	5

L-Low Res, LI-Low Res Interlaced, M-Medium, H-High Res

ANIMATION SOFTWARE

Product	Supplier	Price	ANIM Compat	Onion Skin	X-Sheet	Sound	Rating	Issue
Disney Animation Studio	Silica	£80	Yes	Yes	Yes	Yes	****	1
Fantavision	HB Marketing	£50	No	No	No	Yes	****	14
MovieSetter	Silica	£80	No	No	No	Yes	****	14
Take-2	Rombo	£95	No	No	Yes	Yes	****	14

SOLID MODELLING/RAY TRACING

Product	Supplier	Price	Ray Tracing	24-bit	Animation	Bump Maps	Textures	Rating	Issue
Real 3D 1.4	Alternative Image	£120	Yes	Yes	Yes	Yes	Yes	*****	4,7
Imagine	Silica	£235	Yes	Yes	Yes	No	Yes	*****	4,7
3D professional	Marcam	£260	Yes	Yes	Yes	No	Yes	***	7
Draw 4D	Surface UK	£150	No	No	Yes	No	Yes	***	7
Sculpt 4D	Alternative Image	£400	Yes	Yes	Yes	No	Yes	*****	7

MISC GRAPHICS

Product	Supplier	Price	Type	Rating	Issue
VistaPro	HB Marketing	£100	Fractal Landscapes	*****	7
Genesis	MicroIllusions	£50	Fractal Landscapes	****	11

IMAGE PROCESSORS

Product	Supplier	Price	24-bit	Max Colours	File Formats	Composition	Colour Control	Rating	Issue
Art Department	Silica	£100	Yes	16.7 m	Many	No	Yes	****	-
Art Department Pro	Silica	£200	Yes	16.7 m	Many	Yes	Yes	*****	10
PIXmate	Precision	£70	No	4096	IFF, Neo	No	Yes	****	-
Butcher 2	HB Marketing	£50	No	4096	IFF	No	Yes	***	-

PAGE LAYOUT SYSTEMS

Product	Supplier	Price	Outline Fonts	Pantone	Postscript	24-bit Col	Colour Sep	Rating	Issue
PageStream 2.2	Silica	£200	Yes	No	Yes	Yes	Yes	***	2,3
ProPage 2.1	Silica	£250	Yes	Yes	Yes	Yes	Yes	*****	1
Saxon Publisher	Surface UK	£200	Yes	No	Yes	Yes	Yes	***	-
PageSetter 2	Silica	£100	Yes	No	No	No	No	***	-
Shakespeare	Cloudhall	£100	No	No	Yes	No	Yes	***	-
CityDesk	Precision	£130	No	No	Yes	No	No	**	-

STRUCTURED DRAWING PROGRAMS

Product	Supplier	Price	Bezier Curves	Postscript	Outline Fonts	EPS compat	Rating	Issue
ProDraw 2.1	Silica	£132	Yes	Yes	Yes	Yes	*****	-
DesignWorks	Silica	£100	Yes	Yes	Yes	No	**	-

CAD PACKAGES

Product	Supplier	Price	DXF Compat	No. Of layers	Vector Fonts	Postscript	Rating	Issue
DynaCADD	ExpressWorks	£650	Yes	256	Yes	Yes	****	3

PRODUCT LOCATOR

X-CAD 2000	Digital Multimedia	£129	Yes	255	Yes	With util included	****	-
X-CAD 3000	Digital MultiMedia	£300	Yes	255	Yes	With util included	*****	-
UltraDesign	Marcam	£200	Yes	128	Yes	Yes	***	-

WORD PROCESSORS

Product	Supplier	Price	Spell Checker	Thesaurus	Picture Import	Rating	Issue
Scribble!	HB Marketing	£30	Yes	No	No	***	6,9
Transwrite	HB Marketing	£40	Yes	No	No	***	6,9
Pen Pal	Harwoods	£80	Yes	No	Yes	****	6,9
Kind Words 2	HB Marketing	£50	Yes	No	Yes	**	6,9
Protext 5.5	Arnor	£150	Yes	Yes	No	*****	6,9
Wordworth	Digita	£130	Yes	No	Yes	****	4,6,9
Excellence 2	HB Marketing	£130	Yes	Yes	Yes	****	6,9
ProWrite 3.2	Silica	£143	Yes	Yes	Yes	***	12
Word Perfect	Sentinel	£230	Yes	Yes	No	***	-

DATABASES

Product	Supplier	Price	Type	Programmable	dBASE Compatible?	Rating	Issue
Infofile	HB Marketing	£50	Card Index	No	No	***	9
ProData 1.2	Arnor	£100	Card Index	No	Yes	****	9
SuperBase	Precision	£30	Relational	No	Yes	****	9
SuperBase 2	Precision	£100	Relational	No	Yes	****	9,12
SuperBase Pro 4	Precision	£400	Relational	Yes	Yes	*****	4,9
Organize 2	HB Marketing	£62	Relational	No	Yes	***	-

SPREADSHEETS

Product	Supplier	Price	Lotus Compatibility	Graphs	Rating	Issue
SuperPlan	Precision	£80	Yes	Yes	***	9
Analyze!	Precision	£50	Yes	Yes	***	9
Maxiplan 500	HB Marketing	£80	Yes	Yes	***	9
ProCalc	Silica	£150	Yes	Yes	*****	-
Advantage	Silica	£100	Yes	Yes	****	1,9
K-Spread 3	Kuma	£70	Yes	Yes	***	9
K-Spread 4	Kuma	£100	Yes	Yes	****	9
DGCalc	Digita	£40	No	No	**	-
Analyze 2	HB Marketing	£50	Yes	Yes	***	-

MULTIMEDIA

Product	Supplier	Price	Interactive	External Drivers	ARexx	Rating	Issue
Presentation Master	HB Marketing	£350	Yes	No	No	****	9
HyperBook	Silica	£100	Yes	No	Yes	****	6
AmigaVision	Commodore	£80	Yes	Yes	Yes	****	-
CanDo 1.5	Checkmate Digital	£130	Yes	No	Yes	*****	-
Viva!	MicroDeal	£200	Yes	Yes	No	**	-

VIDEO TITLERS

Product	Supplier	Price	Overscan	Transitions	Amiga Fonts	Horiz Crawl	Rating	Issue
Broadcast Titler 2	HB Marketing	£234	Yes	Yes	No	Yes	****	2
Scala 1.1	Silica	£250	Yes	Yes	Yes	No	*****	2
Scala 500	Silica	£100	Yes	Yes	Yes	No	****	-
Alternative Scroller	Alternative Image	£50	Yes	No	No	Yes	***	-
Home Titler	HB Marketing	£40	Yes	No	No	Yes	***	9
ProTitler	HB Marketing	£100	Yes	Yes	Yes	Yes	***	9
Video Caption Designer	Maze	£200	Yes	No	Yes	Yes	***	3
Video Ease	Interactive Tchnlgy	£40	Yes	Yes	Yes	Yes	**	11

DTV UTILITIES

Product	Supplier	Price	Type	Rating	Issue
AntiA	Zen	£40	Font Enhancer	****	8
BT2 Font Enhancer	HB Marketing	£130	Font Enhancer	***	8
ShowMaker	Silica	£250	Presentation System	***	10

PRODUCT LOCATOR

Elan Performer 2	Silica	£180	Presentation System			****	11
Deluxe Video 3	Electronic Arts	£100	Presentation System			****	-

MIDI SEQUENCERS

Product	Supplier	Price	No. of Tracks	Amiga Samples	Song Arrange	Rating	Issue
Sequencer One	Gajits	£90	20	Yes	Yes	****	2
Bars&Pipes Pro	Zone	£200	Unlimited	Yes	Yes	*****	3
Pro-24	Evenlode	£300	24	No	Yes	***	4
Harmoni	HB Marketing	£50	24	Yes	No	***	7
KCS 3.5	Zone	£280	48	Yes	Yes	*****	8
Tiger Cub	Zone	£100	12	Yes	Yes	****	-
Music-X	MicroIllusions	£150	256	Yes	No	****	-
Music-X Junior	MicroIllusions	£50	256	Yes	No	****	-
Master Tracks	MCM	£200	64	No	Yes	***	-
Trax	MCM	£70	64	No	Yes	*****	-

MISC MIDI SOFTWARE

Product	Supplier	Price	Type	Rating	Issue
JAM	Zone	£100	Algorithmic Composition	*****	-
X-Or	Zone	£220	Librarian	****	6
CMPanion	Gajits	£100	Patch Editor	****	6
Caged Artist	Zone	£100	Patch Editor	***	6
Copyist Apprentice	Zone	£100	Score Notation	****	-
Copyist DTP	Zone	£230	Pro Score Notation	****	-
Audition 4	HB Marketing	£50	Sample Editor	*****	10
AudioMaster 4	HB Marketing	£80	Sample Editor	*****	-
Audio Sculpture	SMG	£50	Sample Sequencer	**	12
Quartet	MicroDeal	£50	Sample Sequencer	***	-
Mugician	Thalamus	£30	Sample Sequencer	***	-
Music Studio	HB Marketing	£25	Sample Sequencer	**	-
TFMX	HB Marketing	£45	Sample Sequencer	***	-
OctaMED 2	AmigaNuts	£20	Sample Sequencer	*****	-

EDUCATIONAL SOFTWARE

Product	Supplier	Price	Type	Rating	Issue
Learn to Read With Prof	Prisma	£25	Reading	***	2
The Three Bears	School Software	£23	Reading	***	2
Donald's Alphabet Case	Entertainments Int.	£25	Reading	***	2
Let's Spell	Softstuff	£20	Writing	****	2
Things To Do With Words	Softstuff	£20	Writing	***	2
Kids Type	GeniSoft	£25	Writing	****	2
Mickey's Zoo	Entertainments Int.	£25	Maths	***	2
Game, Set & Match	GeniSoft	£21	Maths	**	2
Magic Maths	School Software	£23	Maths	***	2
Fun School 3	Europress	£25	3 'R's	*****	2
Fun School 4	Europress	£25	3 'R's	*****	9
Puzzle Book 1	Softstuff	£20	3 'R's	****	2
Sesame Street	Merit Software	£16	Painting	***	2
Play It Safe	Deja Vu	£3.50	General	****	2
Pick A Puzzle	Deja Vu	£2.50	Jigsaw	***	2
Hooray For Henrietta	Sketlander	£25	Maths	***	2
Back To Basics	HB Marketing	£40	Maths	***	9
Maths Adventure	HB Marketing	£26	Maths	****	9
Spell!	Europress	£9	Writing	***	3
Maths Blaster Plus	Ablac Computec	£40	Maths	***	3
Maths Mania	School Software	£23	Maths	****	3
Better Spelling	School Software	£23	Writing	****	3

PRODUCT LOCATOR

PRODUCT LOCATOR

Answer Back Quiz	Kosmos	£20	3 'R's	****	3
Weather Watcher	GeniSoft	£25	Weather	***	4
What Is It?	GeniSoft	£20	Geography	****	4
Better Maths	School Software	£23	Maths	***	4
French Mistress	Kosmos	£20	French	****	4
Mr Robot's Speak&Spell	HB Marketing	£25	Writing	***	6
Early Learning Maths	ESP Software	£20	Maths	***	6
SpelliCopter	ESP Software	£20	Writing	****	6
Spell Book	SoftStuff	£8	Writing	****	6
Cave Maze	Coombe Valley	£12	Quiz	***	7
Maths Dragons	Coombe Valley	£12	Maths	***	7
Shapes & Colours	Rainbow	£8	Basic	****	7
First Letters	Rainbow	£8	Reading	***	7
Reasoning With Trolls	Coombe Valley	£15	Quiz	****	8
Spellbound	Lander Software	£26	Writing	****	10
Cound & Add	Lander Software	£26	Maths	****	10
Pepe's Garden	Prisma	£26	3 'R's	****	10
Picture Book	Triple 'R' Education	£20	3 'R's	*****	10
Money Matters	Triple 'R' Educational	£20	Money	*****	-
Maths Adventure	Kosmos	£26	Maths	***	12

PROGRAMMING LANGUAGES

Product	Supplier	Price	Language	Compiler	Rating	Issue
GFA BASIC 3.5	GFA Data Media	£50	BASIC	Separate	****	3,9
GFA Compiler	GFA Data Media	£30	Compiler	-	****	3,9
Blitz	Siren Software	£70	BASIC	Yes	***	3,9
AMOS	Europress	£50	BASIC	Separate	*****	3,9
AMOS Compiler	Europress	£30	Compiler	Yes	****	5,9
AMOS 3D	Europress	£30	BASIC Extension	-	*****	5,7
AMOS Tome	Deja Vu	£30	BASIC Extension	-	****	11
Easy AMOS	Europress	£35	BASIC	No	*****	12
HiSoft BASIC	HiSoft	£50	BASIC	Yes	****	9
RQ Forth	HB Marketing	£80	Forth	Yes	****	9
Lattice C 5	HiSoft	£230	C	Yes	*****	3,9
Aztec C	Precision	£130	C	Yes	****	9
M2 Amiga	Real Time	£125	Modula-2	Yes	****	7,9
ArgAsm	HB Marketing	£60	Assembly	-	***	9
Devpac 3	HiSoft	£70	Assembly	-	*****	10,12

UTILITIES

Product	Supplier	Price	Type	Rating	Issue
Ami-Back 1.4	Omega Projects	£50	Hard Disk Backup	*****	9
QuarterBack	HB Marketing	£50	Hard Disk Backup	****	5
Personal Fonts Maker	HB Marketing	£70	Bitmap Font Editor	***	7
GB Route Plus	Complex Computers	£80	Journey Planner	*****	10
GB Route Plus Edit	Complex Computers	£30	Editor For GBRoute	****	10
Flow 3.0	Silica	£80	Ideas Processor	***	10
Turbo Print Pro	HB Marketing	£50	Enhanced Printing	****	11,12
Directory Opus	Checkmate Digital	£40	Directory Utility	*****	-

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Ablac Computec	0626 331464	Deja Vu	0942 495261	GeniSoft	0753 686000	MCM	081 963 0663	Sentinel	0932 231164
Accolade	071 738 1391	Digita	0395 270273	GFA Data Media	0734 794941	Merit Software	0101 214 385 2353	Silica	081 309 1111
Alternative Image	0533 440041	Digital Multimedia	0702 206165	Harwoods	0773 836781	MicroIllusions	0480 496497	Siren Software	061 724 7572
Amiga Centre Scotland	031 557 4242	Electronic Arts	0753 549442	HB Marketing	0753 686000	Omega Projects	0925 763946	Sketlander	041 357 1659
Arnor	0733 68909	Entertainments Int	0268 541212	HiSoft	0525 718181	Precision	081 330 7166	SMG	0274 562999
Checkmate Digital	071 923 0658	ESP Software	0702 600557	Interactive Technology	0423 501321	Prisma Software	0244 326244	Softstuff	0732 351234
Cloudhall	0604 231211	Europress	051 357 1275	Kosmos	0525 53942	Rainbow	0392 77369	Surface UK	081 566 6677
Commodore	0628 770088	EvenLode SoundWorks	0993 898484	Kuma	0734 844335	Real Time Associates	081 656 7333	Triple 'R' Software	0742 780370
Complex Computers	0706 224531	ExpressWorks	0252 726255	Lander Software	041 357 1659	Rombo Productions	0506 466601	Zone	081 7666564
Coombe Valley	0626 779695	Gagits Music Software	061 236 2515	Marcam Ltd	071 258 3454	School Software	010 353 61 45399		

That was the

AMIGA SHOPPER

Here's your at-a-glance guide to all the features reviews and tutorials ever to have appeared in the first twelve issues of your favourite magazine

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year that was

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WIN • WIN • WIN • WIN • WIN • WIN • WIN • WIN

Win a Swift colour printer from Citizen!

Yep, it's your chance to win nearly £500 worth of printer kindly donated by Citizen and experience the vibrancy of full colour

Our challenge this month will leave one of you lucky, lucky people out there with a fabulous Citizen Swift 24e printer and everything you need to get printing immediately.

There's none of that fuss about trying to find the correct printer driver – included with the package is the *Citizen Print Manager* program, custom-written to produce the best possible results. The program removes banding effects, uses smoothing to increase the sharpness of images, and provides facilities for image scaling, colour and gamma correction.

Full colour output is provided with Citizen's colour kit.

The original Swift 24 was reviewed in *Amiga Shopper* issue 4, and was recommended as the best buy amongst the 24-pin range. The 24e is an enhanced version of this same printer.

These enhancements include an improved print speed – now up to 216 characters per second – a quiet mode, and a colour kit.

As you can see, it's definitely a piece of kit worth getting your hands on. And all you have to do is provide answers to the questions on the right and send them in to us. It couldn't be easier!

Just jot your answers down on a postcard or the back of a sealed envelope and send them to:
Printer Palaver
Amiga Shopper
29 Monmouth Street
Bath BA1 2DL
The closing date is 9 June. Multiple entries from the same household or church (the guilty party knows who we mean) will not be accepted – you have been warned! AS

THE CHALLENGE

QUESTION 1

Who wrote, starred in and directed the film *Citizen Kane*?

a) Orson Wells
b) Orson Scott Card
c) Jacques Derrida

QUESTION 2

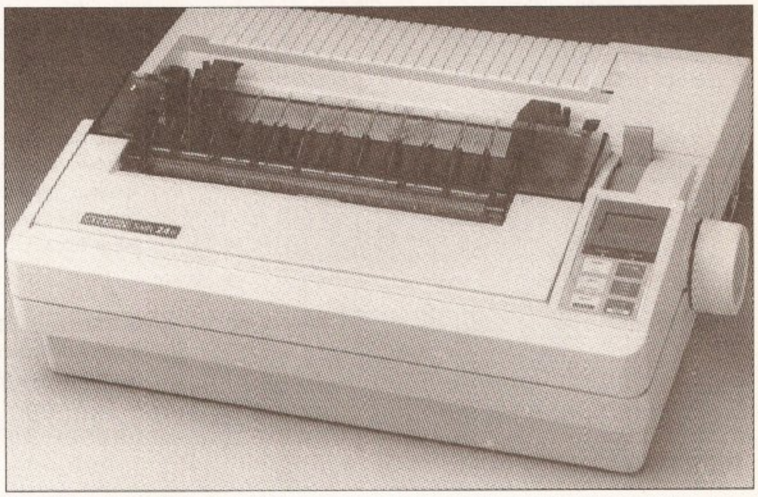
What does the term 'cock-up' mean in printing?

a) a horrendous mistake
b) a raised capital in a larger typeface than the other letters
c) one barnyard animal too many

QUESTION 3

When was Citizen Europe founded?

a) 1066
b) 1979
c) 1985



The Citizen Swift 24e is a handsome machine, and no mistake. Capable of printing in full colour, and augmented with Citizen's custom *Print Manager* program, it produces results of remarkable clarity

ANOTHER WINNER

Yes, it's true – *Amiga Shopper* can exclusively reveal the winner to the competition set in the May edition. It is (tadadadadadah!) Mr J Fleming of East Kilbride. Well done Mr Fleming; a genlock will be winging its way towards you.

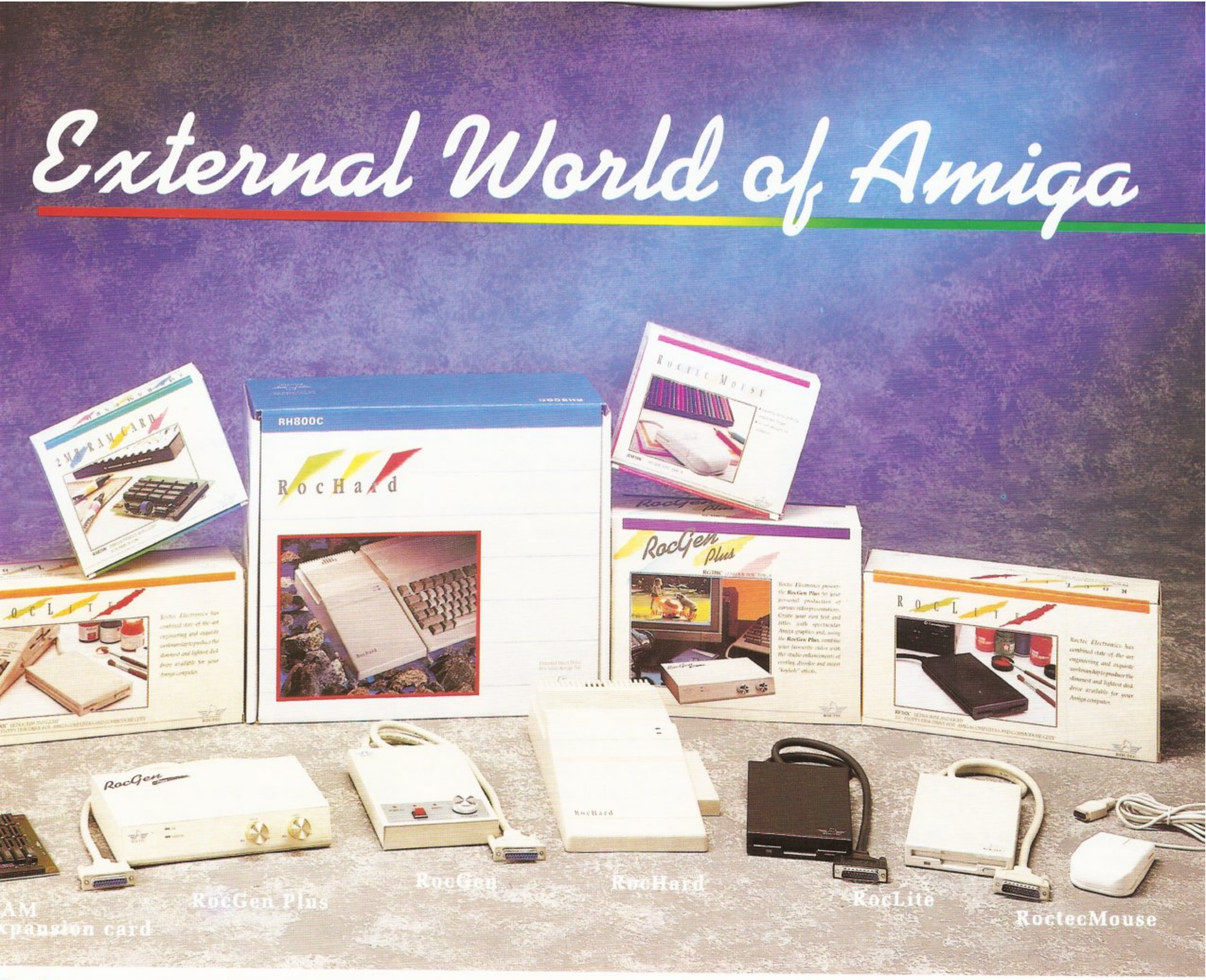
CALLING ALL GFA BASIC WINNERS

(or, it's the *Amiga Shopper, You're fired – Ed, admin cock-up corner*) If you were one of our GFA Basic winners, could you please get in touch with your full names and addresses as soon as possible.

IN NEXT MONTH'S ISSUE

June 4 sees the return of your favourite magazine, in which we'll have our usual *Amiga Answers* extravaganza, all our regular informative columns, and...

- The public domain top 100. We rate the best, most useful PD programs and show you how to set up a productive system for next to nothing.
- Philip Gladwin continues his artificial intelligence series. Join the cutting edge of AI research – build a neural network in AMOS!
- We look at *Morph*, a new 3D modelling package from the US.
- Paul Overaa examines Dataschool's correspondence course in assembly language and decides whether or not it's right for you.
- So, happy computing until next time, folks! Right, let's get down the pub...

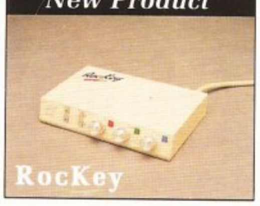


RocKey	Chromakey & special video effects device for Amiga
RocLite	The World's slimmest external drive for Amiga or CDTV, with anti-virus and no clicking functions
RAM Cards	Available in 512KB, 1MB and 2MB versions for A500 and A500 Plus
Roctec Mouse	Hi-resolution replacement mouse
RocGen	A full-featured, budget-priced hobbyist's genlock with adjustable fade and overlay effects
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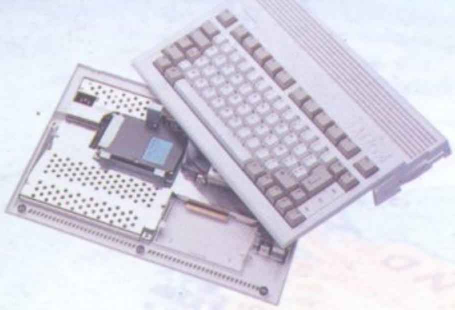
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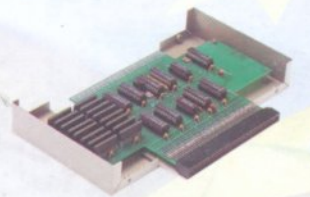
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